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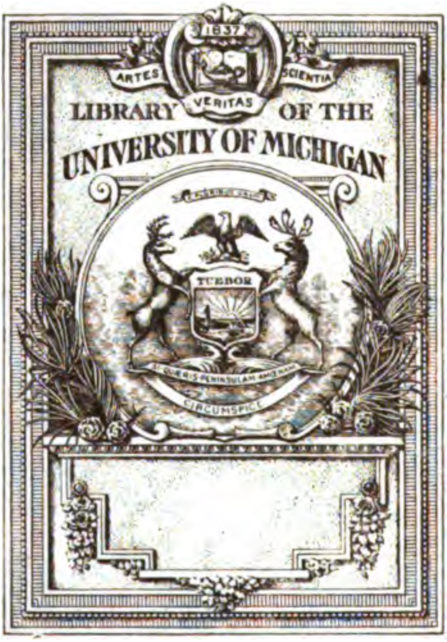
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SECRETARY'S REPORT.

To His Excellency Leon Abbett:

GOVERNOR—We herein present to Your Excellency the associated reports of the State Board of Health and the Bureau of Vital Statistics. The field covered by the science of hygiene and the details of public health administration is constantly enlarging. It includes such widely-divergent subjects as law, engineering, architecture, statistics, chemistry, meteorology and geology, in addition to those which form part of the routine training for the profession of medicine.

The year 1891 has been to us one of great encouragement. Not only is the public attention more aroused to the importance of the subject, but more skilled attention is being given to the great questions of water-supply and sewerage. Boards of Health are realizing more the weighty obligations and the great possibilities of sanitary administration, and Inspectors are becoming more informed as to the details of their duties. We believe the Reports, the Book of Circulars and the Inspectors' Guide, as furnished by the Board, are doing much to bring our local authorities to a higher standard of duty and to a more thorough enforcement of the law.

If we compare our condition with that of ten years ago, we have reason to feel that the State is fairly started on the high road of sanitary progress. If, however, we compare our present status with that of most English cities and rural districts, or even with a few advanced cities in our country, we have reason to deplore the distance we still are from reaching the models before us, and to impress the need there is of more active and thorough administration and execution of sanitary laws. There is no subject which more concerns the whole people, or as to which the wage-classes especially are so dependent upon effective municipal regulation and enforcement. The contrast of effective and neglectful sanitary care is constantly demonstrating to us how many lives are sacrificed for the want of that enforced clean-

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liness and of those precautions which have so much to do with the prevention and mitigation of disease. Even independent of the death record, the time that is lost and the extra expense incurred by avoidable sickness levy and collect a tax hard to be borne by the families thus burdened.

The large correspondence and frequent calls from Local Boards, and their response to all inquiries, show that we are co-workers in the great effort to advance the practical administration of sanitary affairs. While, from circumstances, we have not the same responsibility for Hudson county as for the rest of the State, we are not without hope that it, too, will in the fulness of time be brought up to the methods now prevailing in other parts of the State. It no doubt has its special complications, which cause its exceptional insanitary condition to be a menace to the entire State.

The State Board is more and more striving to make itself a bureau of information for each Local Sanitary Board. It seeks no local authority, but it does hold itself as the willing and accepted helper to all high standards of excellence, and, if need be, the critic of local neglects and failures. It has no desire for any local powers, and has no occasion for any personal strife, but it does protest against the forms of sanitary administration without the substance. On questions in which it cannot be expert it seeks and furnishes competent advice, and dispenses as best it can the knowledge it possesses or secures.

While depending less on extended reports, it hopes to be more and more aggressive in its examinations of institutions and localities, to earnestly persuade to right methods, and to specify and expose wrong methods where it cannot initiate reforms.

THE GROUND AS RELATED TO HEALTH.

Not enough consideration is given to the ground as it affects public and private health. A barren soil is generally healthy, because it is free from animal and vegetable matter, from bad gases, is porous, and unless from peculiar conditions the water-level is high, it is also dry. Much of the healthfulness of our sea-side resorts is as much due to the clean soil as to the pure ocean air. Sometimes ground that appears healthy is unhealthy, by reason of concealed deposits of organic material not changed to peat, or by some peculiarities of geological structure. Some rocks even are porous, and some in their breaking down almost deserve the name of rotten stone, because of the debris mingled with them. Fortunately geology now determines for us, not only the health character of soils, but of the underlying structure. We can be told what ground is fit to be built upon, or how to make it fit. Fertile soils may be often suited for dwelling-places if only surrounding grounds are thoroughly cultivated so that the organic matter is disposed of from year to year.

Nature, too, has its conservative and healthy ways of disposing of organic matter, in field, forest and swamp, if unmolested by the art of man, or aided by it where indications are clear.

Strange to say, the most constant art of man is to pollute the ground. He throws upon it all sorts of foul matter. When this becomes unsightly to the eye, or unpleasant to the nose, he conducts it into a hole which he calls a cesspool. "Out of sight, out of mind," does not prevent the evils which come from the storage of filth, or from ground or air polluted thereby. It is true that in some porous soils, or with frequent changes of locality, nature will for a long time take care of bad deposits. But we must be sure that this is done if we rely on such methods.

Two of the most serious questions as to the condition of ground are the quality of the ground-air, and the height and quality of the ground-water. Nearly all soils are porous enough for us to be able to say that much of the ground for ten or fifteen feet beneath our tread is occupied by ground-air or ground-water. If the ground-air is foul, in the various changes made by frost and weather, it breaks through to foul the air above it, or, still more, is sucked into the basements of our houses to pollute the air we breathe in our homes. If the ground-water is impure, by evaporation it gives up its qualities to the ground-air, or finds its way into our springs or wells. Much of risk is added by the fact that the water-level in the ground is so frequently changed. Statistics and observations very definitely show that the risks of sickness in all cases, where ground is not thoroughly pure, are increased when the water-level falls lower than usual by reason of drought, and when long and severe rains succeeding bring to the surface stores of polluted air from material which had been held back from decay by its previous soakage in water.

Baldwin Latham, C.E., in a recent address before the Royal Meteorological Society, on "The Relation of Ground-Water to Disease," speaks as follows:

"As a rule, the years of high water are usually healthy, except that it often happens when high water follows immediately upon marked low water, that on the rise of the water an unhealthy period follows. Our tables show the very high death-rates in the first quarter of all years following marked low-water periods. * * * *

"Many epidemics, especially of cholera and typhoid fever, have been traced to particular rainfalls. The remarkable correspondence between rainfall and fever is shown by the diagrams of the outbreak of typhoid fever in Paris, in 1882. The majority of the zymotic diseases follow the period of percolation and are most rife in the year of lowest water.

"The year 1714 was a remarkably dry year, when only 11.19 inches of rain were recorded as falling in Upminster. In that year the burials in Croydon were more than double those of the preceding year, and iu London the burials rose from 21,057 in the preceding year to 26,569 in this particular year. Another dry year was 1742, when 15.7 inches of rain were recorded at London. In that year the burials in Croydon was almost three times as numerous as in the following year, whilst the burials in London were 32,169, as against 27,483 in the following year.

"There have even been greater periods of drought recorded than in the years mentioned, and without exception they have exercised a baneful influence; so, in modern times, the periods of drought mark the periods of disease. On the other hand, wet summers are usually healthy. Those years in which there has been no low water are those in which health has been invariable good. In the year 1829 the records of the well at Hartlip Place show that there was no low water at the usual period in that year. The waters rose continuously through the year, up to June, 1830, and so, too, with other years in modern times, such as the years 1860 and 1879, when a similar state of things existed, and these are all healthy periods. We must also bear in mind, in studying these questions, that the rates of mortality are by no means so reliable as the rates of sickness."

While there are many things obscure in the relation of the ground to health, we regard this one as to air and water in the soil, as among the most significant and determinate. While, for instance, as to typhoid fever we are not able to adopt the view of Pettenkoffer, of Munich, in all its definiteness, yet it is largely desseminated by drinking-water, especially when the water-level is low, and when after unusual lowness the water is rising in the ground. The same is probably true as to malarial fevers, diphtheria, cholera and other zymotic diseases.

What control have we over these facts? They emphasize the importance of keeping all filth of every kind above and out of the ground, except where it is to be plowed for cultivation. This means that all slops are to be kept from around buildings, and either disposed of in the garden, or carried away from dwelling-places, or to be thrown upon the ground here and there to such small extent as that nature can easily care for them.

As to cities, it means the constant and complete removal of all things which tend to decay, whether it be in the form of soiled liquids, garbage or household offal of any kind. It means thoroughly clean streets, since street refuse is really a compost. If left, it is either carried directly into the ground by rains, or in the form of dry dust mingles with the air we breathe, until the rain washes it back again into the soil.

As to water in the ground, it means a low water-level, so that fluctuations in height cannot take place within several feet of the surface, or just below the bottom-level of all basements and cellars. This, in most cities, can only be accomplished by thorough and deep drainage, which must be distinct from all sewers or surface carriage of water. It also means for most country homes a much deeper drainage than is generally secured. Pure ground and pure water, with a low water-level, will thus provide a good foundation for health, and go far toward securing the prevention or diminution of disease.

WATER-SUPPLY, SEWERAGE AND SEWERS.

The past five years has witnessed a great change in public sentiment in most of our cities as to the necessity of a pure and assured water-supply, and of systems of sewerage to replace cesspools. It cannot be too soon realized that a city well is never safe against contamination, and that the retention of decayable matter in the soil of cities, whether by storage cesspools or by saturation of the soil from the surface, is never to be tolerated. Cities can very nearly approximate the health of good rural localities if only there are proper drainage of the ground, a good water-supply, well-kept sewers, proper house connections, and a sanitary administration in accord with what are now the well-understood rules of effective oversight. One after another, cities and towns are reported to us as seeking or arranging for sanitary improvements. The great misfortune is that many are willing, for present saving of taxes, to put themselves in the hands of companies. It is always best for a city or town to control its water-supply and its sewer system. Where any contract is made with a company, there should be a stipulation as to all details of construction and keeping in order, and the city should have the right of purchase by arranged valuation based on real values.

It is wisdom on the part of even our smaller towns to perfect their sanitary administration, and to provide to a limited degree, but on a broad system, for such sewerage as is sure to be required. So long as the conditions of human life require disposal to be made of the various forms of debris which are the result of human and household life, and so long, especially as people live in close proximity in towns and cities, the question of sewage disposal will be one of direct concern in its bearing on health and disease. Sewage stands for waste, for decay, for organic matter in a state of change, and generally for it as tending to decay and as associated with water.

If it is at all self-evident that cleanliness is one of the conditions favorable to health, and that decaying or putrescent matter should not be stored amid homes, so as to permeate the ground and to defile its water or its air, it is equally evident that it will be found necessary to provide for its removal. The first idea was to collect it for the enrichment of soil, and so for the use of all vegetation. Experience in the most practical and economic of populations has shown this not to be feasible in large cities, however wise it may be in the country, if only the collection and removal are conducted on a plan consistent with the sustained health of the people. It has been conclusively shown, as a rule, that the compost value of these city products will not pay for the transportation to country lands, and that in the transportation some risks are involved. While this does not apply to all compost, such as that furnished by stables, &c., it is especially true of the materials which accumulate in the ordinary conduct of human life and households. For the removal of all such debris, water-carriage through pipes is now the accepted method. In other words, sewers have come to be regarded as indispensable for cities. We have heretofore discussed the connection of houses therewith by means of house-pipes, and the various devices for securing these house systems against their own possible evils, as well as from any evil that may arise from the connection with sewers. In this report, we also have an article on traps bearing on this protection. Our present design is briefly to submit the necessary conditions for the proper carriage and disposal of liquid sewage, after it reaches these pipes known as sewers.

We can speak of it as a liquid, notwithstanding some solid matter is carried, because water is so largely a constituent, and because it is so quickly seized upon by various low forms of life as to hasten its dissolution with liquid or into suspended particles. The first idea of a perfect sewer is that it be a pipe, tight and continuous, so that it will carry to the intended point all the material that flows into it. To this intent, it must be so constructed as not to admit of stoppage or leakage, and so as to carry away the contents with sufficient velocity, as well as to accomplish some scouring or cleansing. Thus it is stated that sand will be carried by a stream flowing at the rate of six inches per second, but be deposited if the velocity becomes less. Pebbles one inch in diameter are carried by a flow of about two feet per second (Hering). Sewers are not now made round, and even the egg-shaped can be improved upon, where the stream is small, by having a shape at the lower part which will still more constrict the flow.

Vitrified pipe has the advantage in that it is smoother than brick on the inner surface, so as not to retain particles. Yet we have as yet no device of smoothness or cleansing or flushing by which to keep the inner surfaces absolutely clear of any growth or deposit which causes a kind of slime. We greatly diminish it, however, and probably prevent any evil effects therefrom, when sewers are thorougly ventilated and flushed both by draught and water. Disinfectants also aid. The fumigation of sewers by sulphur has also been tried, and with apparent success, as in Detroit. If there is evidence, as there seems to be in some cities, that the contagium of typhoid fever or of diphtheria has become domiciled in some sewers, this method should be resorted to. As to ventilation, it is always to be remembered that mere vents or openings are not ventilation, unless a draught of air can be secured through them. As ventilation depends upon a sustained difference of temperature and to some degree of humidity, we are frequently to test the actual currents. Storm-water is much relied on for flushing. The trouble with this is that it is so irregular and is so often absent when it is most needed. It would be well if, from time to time at regular intervals, sewers could be made to run half full. The question which at present is most discussed is that relating to the disposition to be made of sewage. This depends so much upon locality and upon various conditions that it is an error to attempt any uniform rule as to it.

There are cases where the best use that can be made of a stream is to use it as a sewer, and let all material be hastened to the sea. There are other cases where the stream is of such use as a water-supply that it must be protected from sewage. Even where not needed as water-supply, the sluggish flow or the need of the stream for comfort or ornament, forbids its sewer use. There are cases where a regulated amount of sewage may be allowed to pass into a stream, or where objection can be met by a previous purification of sewage by some one of the various methods of separation, filtration or precipitation now well understood. We have before fully discussed the various systems of broad irrigation and of intermittent filtration by means of land, and plans of precipitation and compression which the use of various chemicals and of filter presses have rendered feasible for purification sufficient to pass the effluent into streams not used for drinking purposes. Preference of method depends largely upon questions of the relative cost and the degree of purity which has to be secured. Intermittent filtration, through properly-prepared land, no doubt affords the purest affluent. Since the experiments of Mr. Mills, of the Massachusetts Board, have placed the subject of filtration on a better understood basis, it is probable that we may be able to do much both in purifying water and sewage by means of artificial filter-beds. We have to study the conditions favorable to conservative bacterial work, since these micro-organisms are the chief factors, up to a certain point, in purification. Decomposition and gases have to be cared for in a way that will prevent their excessive absorption by water or mingling with the air so as to cause discomfort and disease. In order to outline more fully this real advance in our knowledge of filtration methods, we quote as follows from the Massachusetts report of 1888, and a condensed statement thereof by R. Hering, C.E.:

"The filtering grounds comprise about two-thirds of an acre. Upon them are ten tanks, circular in plan, about seventeen feet in diameter, and allowing for material to be filled in five feet deep. From the lowest point in the bottom of each tank a two-inch pipe conveys the drainage to a flume within a building whence the effluent is taken for analysis and examination.

"The tanks were filled with different materials, as follows: No. 1, very coarse, clean mortar-sand; No. 2, very fine, nearly white sand; No. 3, peat; No. 4, river silt; No. 5, brown garden soil, well manured; Nos. 6, 7 and 8, were filled with three feet eight inches of coarse and fine sand, ten inches of yellow sandy loam, and six inches of brown soil; No. 9, very compact, sandy, hardpan of clay, sand and gravel, covered with nine inches of brown soil. No. 10 was used to measure the rainfall and evaporation. The sewage used in the experiments was taken from a main sewer draining a portion of the city. Apparatus was erected for measuring the sewage and the effluent, and biological and chemical analyses of both were made daily. The sewage was applied intermittently at intervals of one or more days, and disappeared from the surface in a few minutes or hours.

"From the last report of the Board we gather the following statements regarding the general results which were so far obtained:

"Sewage can be much more efficiently filtered through open sand than through sand covered with soil. Very fine material, like dust, in the upper layers of a filter, prevents free access of air, and when wet, may exclude air so completely as to render purification impossible. With soil or sand containing dust at the surface, periods of intermission in the application of sewage may be made so long that the surface, becoming dry, may allow air to enter, and a high degree of purification may result; but the quantity of sewage that can thus be purified is very much less than when the upper layers of the filter are composed of open sand, through which the sewage will rapidly disappear, and will leave room for air to enter and come in contact with the thin laminæ of liquid covering the particles of sand.

"Filtering areas of sand covered with soil, or areas of very fine sand, may be much increased in efficiency, in both summer and winter, by digging trenches in the direction of a slight incline, about two feet deep and one foot wide, and six feet apart, and filling them with coarse sand. The sewage should be applied to this coarse sand, and once in a month or two, a half inch in depth should be taken from its surface and replaced by clean sand.

"A very few vegetable organisms that can be identified by the microscope, have been found to occasionally pass through the coarser filters, but in general none come through.

"Of the still more minute organisms, the bacteria, we found that soon after sewage was first applied to the tanks they came through in great numbers, but became reduced in number, and during the later winter and spring months amounted to 2 per cent. and less of those of the applied sewage; but after nitrification commenced they decreased rapidly, and continued through the summer, in many cases, less than one hundred, and, in some, less than ten, while the number in the same quantity of applied sewage was about a million.

"The experiments made to the present time show that the number of bacteria in the sand decreases very rapidly from the surface downward. In the finer sands they nearly or quite disappear before the bottom is reached. Experiments are in progress to prove whether any live to come through the finer sands with the effluent; but they have already shown that through the very coarse sands they are brought with the effluent in very small numbers, with the ordinary rate of flow from the sewage tanks, and that when the rapidity of flow is the highest, the number of bacteria in the effluent has reached as high as 2 per cent. of the number in the applied sewage.

"In some of the tanks it appears, that of the large number of species found in the sewage, a single species only lives to reach the outlet.

"We have reason to hope that the filters may be so made and managed that all disease germs may be, with certainty, removed, and think this important subject should be pursued to definite conclusions.

"The tanks, which were filled with clean, coarse mortar-sand, received sewage at the rate of thirty thousand, sixty thousand, and one hundred and twenty thousand gallons per day. Until nitrification commenced—after periods of forty-one, thirty-one and twenty-seven days, respectively—97, 94 and 80 per cent. of the impurities of the sewage were removed. When nitrification reached its height, the ammonias were reduced to 1 and 1½ per cent. of those of the sewage.

"The rapidity of purification, as shown by the decrease in ammonias, was greatest in the tanks which had received the most sewage and had the greatest amount of nitrogenous matter stored in them, the effluent from the sand which had received the least sewage being more than a month later in reaching its condition of greatest purification.

"The filter receiving sewage at the rate of one hundred and twenty thousand gallons per acre per day, gave an effluent (for three months after purification, resulting from nitrification, was established), in which the ammonias were less than 1½ per cent. of those of the sewage. Upon increasing the amount filtered to one hundred and eighty thousand gallons per acre per day, the ammonias increased, but for the next four months averaged less than 2 per cent. of those of the sewage.

"The filter receiving sewage at the rate of sixty thousand gallons per day for seven months after purification was established, gave an effluent of nearly constant quality, having one-half of 1 per cent. of the ammonias of the sewage, the free ammonia averaging 0.0012 parts, and the albuminoid ammonia 0.0015 parts in one hundred thousand parts, showing less organic matter than many of the drinking-waters of the State.

"Experiments were made to ascertain the different effects of continuous and intermittent filtration. 'In intermittent filtration the nitrification was active, and, as shown by the ammonias, 99 per cent. of the organic impurities were removed, while in continuous filtration the nitrification ceased, and the same sand, filtering the same quantity of sewage, stored the impurities for a time, but poured out an effluent quite as impure as the applied sewage.'

"Fine sand was found to make the best filter and could purify the sewage to a higher degree at a rate of twelve thousand gallons per acre per day, so that the number of bacteria in the cubic centimeter was reduced from five hundred and ninety-one thousand to two, and the ammonias to one-fourth per cent. of that of the sewage."

"A sand having more than ten per cent. of very fine dust, and also containing nearly two per cent. of organic matter (making up what is known as river silt), gives its best results in December, after filtering in one year 45,000 gallons of sewage, the equivalent of 9,000,000 gallons on an acre, and while filtering at the rate of 12,000 gallons per acre per day. The organic matter of the effluent in the first half of December was reduced to one-quarter of what it was previously, and became but four per cent. of that of the sewage, and the nitrogenous matter, as expressed by the ammonias, became three and one-half per cent. of that of the sewage.

The loss on ignition was	1.0	parts per 100,000.
The free ammonia	0.0800	" " 100,000.
The albuminoid ammonia	0.0190	" " 100,000.

"The number of bacteria in a cubic centimeter of the sewage was 1,100,000, and the number in the effluent, 7.

"The ammonias of the effluent averaged, from March to August, twenty-seven per cent. of those of the sewage, and from September to November eleven per cent. of those of the sewage.

"This material has given poor results during ten months of the year, but has greatly improved during the past month, when sewage has been applied once in two or three days and rain has been excluded from the surface. Garden soil makes a very poor filter. Upon applying sewage intermittently to a body of garden soil five feet deep, after the first month the organic impurities increased continually for eight months, until the effluent became more impure than the applied sewage.

"There had been then applied 24,000 gallons, the equivalent of 4,800,000 gallons on an acre; and it was then being applied at the rate of 10,000 gallons per acre per day.

"The daily quantity passing through has since been reduced to 5,000 gallons per acre per day, and the quality of the effluent has somewhat improved, but still contains as much nitrogenous matter as crude sewage.

"The best results are the last, and are as follows:

Loss on ignition	12.2	parts per 100,000.
Free ammonia	2.9200	" " 100,000.
Albuminoid ammonia	0.2900	" " 100,000.
Nitrates	0.0250	" " 100,000.

"The bacteria number 109, while in the sewage they numbered 200,000."

The question of the discharge of sewage into streams depends upon the localities at which such streams are used for potable or drinking-water. The more or less rapid disposal of sewage emptied into a stream, depends upon the relative amount of sewage and flowing water, the purity of the stream itself, its sunlight, its vegetation, the rapidity and roughness of flow, the animal and vegetable life, &c.

This really means dilution, the ready supply of oxygen and the facilities for the absorption of the gases of decomposition. Here, again, bacteria of different kinds are chief actors. The bacterial activity depends much upon temperature, warmth being friendly to active change.

It has long been known that it is not well to pass sewage into salt water, unless, as in the ocean, the quantity is immense and the course of the waves such as to secure its speedy outgo. It will be deposited also by the action of the salt. The inlets all along our shores are especially to be guarded against the reception of sewage. For various other facts as to sewage we refer to former reports. Our effort is chiefly to allude to new information and experiments.

THE EXAMINATION OF DRINKING-WATERS.

The examination of potable waters is important as determining their fitness for use. Evidence is constantly accumulating that many diseases are conveyed to the system through drinking-water. Two divisions must be recognized, namely, those which arise from general or promiscuous filth, and those which arise from definite and specific and pathogenic forms of minute life. Thus, nausea, diarrhœa, &c., result from common befoulment of water, while typhoid fever, for instance, is claimed to result only from a specific contagium. Distrust of the evil effects of impure water often arises among the masses, from the fact that so much of common or ordinary filthy water may be imbibed by so many persons with impunity. Thus, Emmerich "daily, for two weeks, drank from one to two pints of very foul water taken from a hospital brook, which to the naked eye and to chemical tests was distinctly infected with sewage, and which showed a large amount of chlorides, ammonia and various organic substances. During the first three days he noticed slight gastritis, yet during the remainder of the fortnight no ill effects were recognized. A month later, having acquired a gastro-enteritis, he again tested upon himself, in the same way, the effect of the same sort of water, but observed no detriment to his health."

There can be no doubt that some persons are more resistful of disease than others; that some stomachs better than others neutralize injurious substances, and that in the conservation of nature a kind of toleration of evils is sometimes established, but it would not do for all the children and invalids, or even all the well people, of a city to follow the example of Emmerich. There is abundant evidence that foul waters do disagree with many. What we know of the laws of life teach us that pure water and pure foods are favorable to health, and that impurities are a tax upon vital force—a tax indeed often borne without bankruptcy of health or life, but not in the interests of good health or long life. There is also abundant evidence that impure waters are the culture-places for disease, and invite those specific forms of contagion which too often become epidemic.

It is therefore important that we have means of estimating the comparative or actual purity of water used for drinking purposes. In Circular LIII. of this Board, most of the ordinary tests are given. Besides these,

CHEMICAL EXAMINATIONS

Are valuable, because they help to determine the quality of water by pointing out some of its special variations from the standard of purity. Some of these might possibly exist without injury, just as there may be carbonic oxide in the air without organic impurity; but, as a general fact, such is not the case, and it is a real measure as to its healthfulness.

We know that there are some real criticisms to be made upon chemical examinations as an index of the purity of water, and that they do not reveal the specific infectiveness of this or that germ. But we also know that the results are so uniform and approximate as to be very valuable in making up the evidence in a case, and that, therefore, these results should always be secured for comparison with other kinds of evidence, such as clinical, biological or that derived from the senses. Chemistry, too, is constantly perfecting and increasing its methods of tests.

Thus, the sulphuric acid process for estimating the organic nitrogen, first used by Kjeldahl, in 1883, for solid or semi-solid organic compounds, has been successfully applied by J. A. Blair, of Edinburgh, and others to the analysis of the organic matters contained in potable waters, as well as the sulphuric acid and permanganate process for estimating the organic carbon. While recognizing the limitations of chemical analysis, we cannot dispense with it as a mode of test.

BIOLOGICAL EXAMINATIONS.

There has been much expectation that biological examinations would furnish us with very valuable evidence as to the purity or impurity of water. Thus it has been claimed that the number of bacteria, or other forms of minute life, found in water would be a test as to its purity. But it is also found that the aggregate number does not at all denote those which are of value as helping to purify, or keep pure, and that it is impossible as yet to classify the specific, the injurious, the harmless and the beneficial bacteria. As a rule it is found that there are fewer bacteria in very deep wells, or at the sources of most rivers, yet even here there are some unaccountable contradictions. Not to allude to the evidence of Percy Frankland and others noted in previous reports, Dr. G. C. Currier read, February, 1891, before the American Society of Civil Engineers, a biological study on the "Self-Purification of Flowing Water, and the Influence of Polluted Water in the Causation of Disease." While he found in the Passaic river at Paterson, after receiving sewage, 2,172 bacteria in one centimeter, and 4,000 in a Newark hydrant supplied from the lower Passaic, he found 20,340 in the Delaware near the Trenton water intake, yet he admits the general good character of the upper Delaware and attempts to account for the strange record by a three days' previous rain and by the fact that some forms were found which "are probably antagonistic to the germs of typhoid." This is but an example of the unsatisfactory condition of bacteriological evidence at present. Yet there is reason to hope that more experience and an immense collection of observations from competent observers will enable us to eliminate errors, to classify forms and to add this to other modes of testing.

Multitudes of examples teach us the hazard of general and specific disease from impure waters, especially such as receive sewage, or specific germs. Our safety is in pure water, or when there is suspicion of pollution, in thorough boiling before use until a better supply can be secured.

THE HOMES OF THE PEOPLE.

In the last report, in a paper on the "Homes of the People and Tenement-Houses," the facts in evidence as to the needs of legislation and of more sanitary attention thereto were plainly set forth. Sanitary reform must begin in the home. A large proportion of the population are there defenseless against unsanitary conditions unless the law interposes in their behalf. Many of the causes of sickness are concealed and unknown to tenants. Hence the necessity of skilled and thorough sanitary inspection. Not that of the Inspector who runs in, in order to be able to report how many houses he has inspected in a year, but of the one who makes a full office record in detail and puts it on file for reference in his office. It is easy to have activity without insight. Then the Board must examine these reports and see whether they are in their method up, for instance, to such a standard as is presented in our Inspectors' Guide. This is not all. The Inspector and the Board must know how to reach and remedy the evils found, as far as possible. Present law must be applied and more legislation sought if it is absolutely necessary. Would that all our people could realize that there is no more important part of public service than that which belongs to the Health Board of a village or city. On its efficiency depends, far more than is generally realized, the health, and that means the general prosperity of a people. How much the welfare of the mind, of the pocket, nay, more, of the entire moral nature, depends upon proper conditions in the home and on the public health, needs to be fully considered. We urge our Health Boards to more thorough work in their examination of house conditions and the condition of rear yards, of cesspools, &c. Public and street nuisance are more perceptible but not more serious. A good Health Board and good Inspectors can do as much for the welfare of the people as any other division of the public service. In addition to the legislation already had, we need a more stringent law as to tenements, similar to the laws now applied in such cities as New York and Boston.

FACTORY OR EFFLUVIUM NUISANCES.

Citizens by thousands in various parts of our State and especially in and near our larger cities, continue to be annoyed by various fumes and forms of stenches.

Our nearness to New York and Philadelphia, and laws more stringent than our own and a public sentiment more declared and persistent, is, in addition, leading too many of such odor-producing occupations to seek refuge in this State. It ought to be enough that under common law gases or odors being thus produced to the discomfort of the ordinary citizen, have always been adjudged as nuisances. Modern science and experience show us more and more that we cannot thus befoul the air with decaying and volatile organic products without lowering the standard of general health and causing direct or specific sickness to not a few. The extent of some such emanations is illustrated by the single fact that in a careful investigation and estimate as to the amount of sulphurous and sulphuric acid emitted in Manchester by an analysis on three successive days of fog, one and one-half cwt. of sulphuric acid per square mile was deposited in the center. At an outlying station one cwt. of sulphuric acid and thirteen cwt. of blacks (sooty material, &c.) was carried down during the same time. This exposure of the people to the deleterious gases and minute organic particles of foul matter is all the more trying because it can now be so largely prevented. At the recent Congress at London, so high an authority as Sir Henry Roscoe spoke thus: "Another source of pollution more easy to grapple with, lies in the escape of deleterious gases from chemical works and other manufactories. The removal of many causes of such pollution has been satisfactorily accomplished in this country under what is known as the Alkali acts, or more properly the Noxious Vapors acts. Thanks to the care with which these acts have been worked by the Government Inspectors and the manufacturers themselves, the serious complaints which arose of nuisance due to the escape of acid and other noxious vapors are no longer heard; and not only has the public been the gainer by the stoppage of the escapes which formerly occurred, but the manufacturers themselves have also benefited, inasmuch as they have had their attention directed to improvements in their processes which have proved remunerative." A. E. Fletcher (Chief Inspector under the Alkali act), in an outline of "The Present State of the British Law as to the Discharge of Noxious Gases from Manufacturing Processes," said: "The law makes no attempt to stop such operations on account of the noxious gases which are generated, but adopts means for regulating them and sets a limit to the amount of such noxious gases which may be discharged into the air. These noxious gases form but a short list, namely, chlorine and its acid compounds, the acid compounds of fluorine, nitrogen and sulphur, including sulphuretted hydrogen. To these may be added metallic fumes containing lead, antimony, arsenic and zinc." It is true that our range of noxious factories is greater, but there are also various forms of fume destructors and various methods of burning organic matter and gases adapted to these. It only needs the firm hand of the law to compel such factories to investigate methods and to adopt machinery to the accomplishment of the needed result. Besides the present power of Local Boards, it might be wise to compel them, on the application of twelve or more citizens, to ask for injunction and investigation through the Court of Chancery. The power of the court to abate such nuisances was well shown in the Elizabeth case, some time since. By means of fire and steam and by mechanical contrivances, it is claimed that every form of factory nuisance from smoke and organic particles can be overcome.

PHYSICAL EDUCATION AND SCHOOL HYGIENE.

This Board has endeavored for years past to give full recognition to the importance of hygienic care of school buildings and school children, and to physical education as a necessary part of public school training and instruction.

The frequent allusion to it in our reports, the facts adduced, the four circulars issued and the special inquiry made six years since, in co-operation with Hon. E. O. Chapman, State Superintendent of Public Instruction, have not been without their fruits. In addition, we were successful in establishing a definite department of hygienic instruction in the State Normal School, which is now being enlarged and extended. There is still need of far greater attention to this teaching in the public schools of the State. In the school systems of England and of several continental countries it is now accorded its proper place. We this year give especial attention to it in a series of valuable papers. It was also made prominent in the meeting of the New Jersey Sanitary Association. We have also been able to co-operate with the State Superintendent of Schools in his continuous efforts to improve the character of the school buildings and their adaptability to different grades of pupils. We this year also again, with his aid, send to each school district two circulars in book form, one to be retained and one returned, by which we receive answers to the chief questions bearing on school buildings and their appointments, as also upon some points as to the children themselves. The time has come for a general advance in teaching and training as to health and its conditions, and as to the way in which this human mechanism we call the body is to be handled and used and utilized in the great work of life. It is needful also that we thus rear a class of men and women for the next generation who will appreciate the necessities of sanitary habits and administration, and will aid in securing much-needed reforms. We commend the subject to the attention not only of parents, teachers and physicians, but of all who study the best and most vital interests of the State. The school circulars of our Board are suppled to teachers on application through postal, and may wisely be distributed to the scholars in each school. They give many suggestions as to health and education.

PREVENTION OF EPIDEMICS BY NOTIFICATION OF INFECTIOUS DISEASES.

Among the means for preventing the spread of communicable diseases, the importance of notifying health authorities of each case, as soon as recognized, is more and more evident.

It is claimed that some cities owe their immunity from small-pox more to this enforced system than to vaccination. This secures the early and complete isolation of the patient, and proper rules for attendants. Most contagions are diffusable over large spaces, or quickly perish or are diffused in open air. We have had outbreaks of scarlet fever in a boarding-school, which have not spread beyond the first attacked because of due precautions. This isolation will not be secured, as a general thing, without notification. Our law is accurate, is reasonable; and because such notice is different from that as to the fact of the beginning or ending of a life, a small compensation is allowed. The facts are not communicated except to the health officer, and he generally consults the physicians as to the aid he can furnish. H. Littlejohn, in his "Ten Years' Notification of Infectious Diseases in Edinburgh," shows how fruitful it has been in results—how gradually it has led medical men to attend to the duty with almost unexceptional correctness and punctuality. Series of facts are given with statistical details, to show what it has done in checking typhoid fever, diphtheria, scarlet fever and typhus fever. (See Sanitary Record, June 16th, 1890.)

Last year, it will be remembered, we noticed the passage of a general law by the English Parliament, as to which there was much discussion and some opposition. Although in part voluntary, "unexpected success has followed its introduction." In a recent note as to it, Robert Farquharson, M.D., M.P., says: "A large number of localities have adopted it without difficulty. Great sanitary advantages have already resulted from the early detection of disease. We look in vain for proof or even assertion of the great evils of notification, of the shattered confidence, the strained professional relations, the inconvenience and expense, and even actual danger, that were so freely predicted during the early discussion of the bill."

The necessity of making it a requirement is now generally recognized. Our cities and rural villages cannot be too particular as to it. The constitutionality of laws requiring notification has been frequently affirmed.

PREVENTION OF DISEASE BY CARE OF THE MOUTH AND FAUCES.

Among the prominent revelations of the more recent studies of disease is the fact that so many ailments are derived from without, and are not the direct result of changes that are solely dependent upon primary lesions in organs. Most of the diseases spoken of as specific either originate entirely from without, or have their first declarative evidence when some microphyte from the air enters and settles upon the susceptible part. This generally means that the mouth and throat are the great conduits for the introduction of disease, the one class making their entrance into the digestive and the other into the pulmonary or breathing apparatus. Besides the recognized contagions of small-pox, scarlet fever, measles, diphtheria, &c., it is now claimed by good authorities that pneumonia and many ordinary catarrhs are distinctly communicated from the outer air. To these the mouth and fauces are related in two ways. If these are in an unhealthy condition they emit foulness which infects the air, and which is especially injurious to those who most directly breathe in the outcoming breath. Next, an unhealthy condition of the mouth makes it peculiarly susceptible to disease-bearing particles contained in the outside air, and thus invites the sedation and development of disease. The mouth and throat are made up of a series of marvelous structures. Besides glands for lubrication, and for the furnishing of digestive juices, the mucous membranes of the tonsils are filled with crypts and thickly-located lymph follicles and abundant lymphatic and blood vessels so as to be prepared for an activity of service which almost entitles the tonsils to be called organs.

In addition to the chief tonsils the lymph tissue is so abundantly distributed in other parts of the buccal cavity as to have become designated by different names, such as the lingual, pharyngeal and discrete tonsil. Dr. Hingston Fox has called all these lymphoid tissues the "nurseries for young leucocytes." It is so abundant as to furnish a great outspread surface for absorption, so that we have not only the secretive function of the mucous glands, but an absorption apparatus in most intimate relation to the entire lymphatic and circulatory system.

There is more and more reason to believe that many diseases are local before they are constitutional, and that the implanting and development begin in the tonsils or other parts of the buccal cavity; in other words, that the disease is local in the mouth and throat before it is constitutional. This is now very fully recognized as to diphtheria and not unlikely is true of most of the contagious diseases. Nor is this beginning accidental. There is not only this local progress and distribution of disease, but the soil is more fully prepared by the condition of the mouth structures. It is, therefore, most important that minute attention be given to the mode of breathing and to the condition of the mouth and the breath. First of all remember that the nose and not the mouth is the chief organ for the inbreathing of air.

The nostrils are the avenues, the wind-pipes, for the lungs. By their moisture, their minute hairs or cilia and their tortuous course they are admirably fitted to warm and to help to purify the inbreathed air. It is no useless precaution to warn those exposed to concentrated contagion to keep the mouth closed and do all breathing through the nose. Next to this, cleanliness of the mouth is a most important consideration. The sweet, pure breath and the perfect condition of the mucous membranes, the follicles, the teeth and of the entire buccal cavity are not easy of attainment. In it lodge particles from our food, which easily become septic, and to it both from within and without is too often furnished an atmosphere which in its worst forms declares itself as bad breath. The foulness of air and the need of ventilation are not so much because of the carbonic acid in the air as from the organic matter in a mobile or decaying state. Especially where there are assemblages as in school and public rooms, the bad breath of a dozen persons is more polluting than that of a hundred whose mouths are in a perfectly healthy and normal condition. Hence, we cannot too much insist upon mouth-rinsing and frequent cleansing of the breath as indispensable to young and old. Often there is need to add the use of some pleasant disinfectant, as thymol, borax, &c. The subject is a most important one, not only in relation to the health of the individual, but to the prevention of disease. It is now well understood by physicians that in those who are exposed to disease we are apparently able sometimes to prevent contagion by early and close attention to the mouth and its secretions. Topical applications to the throat and the frequent administration of such substances as the tincture ferri chloridi, quinine, potassium chlorate, &c., are for this purpose.

Thus not only are the exposed surfaces of the mouth and throat protected, but the liability of transmitting disease to others is greatly diminished. The care of the mouth and teeth should be an early subject of instruction in each school. Spitting on the floor or in handkerchiefs is to be avoided, and where there is the least disease all expectoration should be received in a disinfecting solution or burned.

In addition to this, the habit of breathing through the nose is to be insisted upon as well as the evils of mouth breathing and excessive talking in very cold or damp air. Now that so much is said as to the prevention of disease by isolation, we are also to study what can be done by systematic cleanliness and with especial reference to the mouth and its secretions.

HUMAN AND ANIMAL DISEASES.

The more thoroughly comparative physiology, pathology and biology are studied, the more evident is it that there are physical similarities in man and the lower animals that are to be studied in the interests of all, and that the comparative study of disease is of essential importance. This has lately been emphasized as never before in the fact that the recent International Congress of Hygiene devoted an important section to papers and discussions on this subject. Besides other allusions and the special attention given to the subject in various reports and in Circular L. of the Board, in our twelfth report, 1888, pages 37–47, will be found a series of facts and references illustrative of this close relation. The Secretary of the Board also furnished to the State Board of Agriculture, report of 1890, a careful paper as to some of these diseases, but with special reference to Tuberculosis. Evidence accumulates as to the identity of several diseases and the similarity of others. What is still more important is, that some of these diseases are interchangeable in their communicability. Not only may animals be the vehicle of contagion, but certain diseases originating in the lower animals are infective. Besides what is well known as to anthrax, hydrophobia, vaccinia, &c., there are many who now add to the list influenza, scarlet fever, diphtheria, tuberculosis and some of the skin diseases. The cow, the horse, the dog, the cat and domestic fowls need special inquiry in reference to their relation both to the origination and extension of human diseases. These are engaging the attention of most of the biologists both in medical and veterinary science, and are being thoughtfully watched by leading practitioners.

Just now, special attention is being given to tuberculosis. Important papers and discussions as to it were had at the special conferences held in Paris in 1888 and in July, 1891, as also at the London Congress, 1891. The general view is that the bacillus of bovine and human tuberculosis is the same, but as to communicability there are various opinions. A Royal English Commission has for over a year past been taking testimony as to it, and is expected to report ere long. There are some that urge that both the meat and milk of cattle showing tuberculosis should be rejected. There are others that claim that there is little risk to muscle or even to milk, unless the udder shows signs of the disease. The subject was well presented by Drs. E. Holden, J. W. Sickler and others, at the last meeting of the New Jersey State Medical Society. We are still needing more facts and more experience. Yet, so real is the existence of the disease and so possible the peril, that we again urge on Boards of Health regulations as to cattle and inspection of all city dairies. This year the Board ordered the killing of nearly an entire herd, because of an outbreak of unusual severity in Sussex county. In connection with comments on some diseases will be found the results of some biological post-mortem examinations made by Prof. Formad, of Philadelphia. It is incumbent on all Boards of Health to seek to protect our domestic animals from filth and other unhealthy conditions, for neglects are not only cruelty to animals, but hazardous to the health of the people. In the absence of public abattoirs and inspection of all meats thereat, the inspection of meat in markets is important. So rigorous is the method in most English cities that not only is all doubtful meat, game, poultry and fish seized, but heavy penalties are often inflicted. In order that any such meats may not get into the market or be manufactured into sausages or canned food, the English Inspectors have ready the following liquid, into which the meats are thrown:

Chloride of calcium	2 cwts.
Chloride of sodium	½ cwt.
Proto-sulphate of iron	1 cwt.
Carbazotic acid	2 lbs.
Water	300 gals.

This does not hinder its use for extraction of lubricating oils or any other legitimate disposal, but does prevent its consumption as food.

The Chicago plan is thoroughly to inject the meat or muscle with kerosene.

DUTIES OF HEALTH BOARDS UNDER SPECIAL ACTS.

In addition to the general system of health laws there are some special laws bearing on public health to which the attention of Local Boards needs to be directed. The law, for instance, as to petroleum and kerosene is such that there should be a watch over the safety of illuminating oils, and every accident should command the close inquiry of the Local Board, and if need be a specimen of the oil should be at once procured for examination. The law as to fire-escapes should be enforced.

The law as to milk and dairy products and oleomargarine is under the special care of Geo. W. McGuire, as Dairy Commissioner, who gives it thorough and efficient attention. He also aids in enforcing the law as to the adulteration of foods and drugs. Local Boards of Health are of essential service in guarding these laws and will be aided by the State authorities as occasion demands. Examination of water-supplies will be made by order of the State Board of Health where Local Boards suspect contamination and have no money at command for such inquiry. All Local Boards should look carefully after the keeping of animals, so as to prevent nuisance, and any cases of contagious disease among them, or of such as may affect meat or milk-supply, should receive prompt attention. There is need of the inspection of all cattle and of all pens of animals kept in the cities, because of their liability to become sources of evil. If any such pen or mode of keeping is found to be a nuisance, it can be dealt with as any other nuisance, independent of the question whether the keeping of such animals in cities is in its very nature a nuisance. There are other laws, such as those as to sewers, as to accidents, as to cemeteries, &c., which need the occasional attention of Local Boards. While it is true that everything that annoys people is not a nuisance in a sanitary sense, yet the province of a Health Board is broad. It should realize the extent of its powers and know how to use them with persuasion, with discretion, and if need be with the force of the law.

INSPECTION SERVICE.

The board has given careful attention to the needs of Local Boards and to any local questions as to which they have needed the advisement of the Board. A Health Inspector has always been sent in cases of complaints in which the Local Board has doubted as to the need or mode of action. Where Boards have failed to avail themselves of ordinances or have made errors as to organization or interpretation of the laws, our Inspectors have been able to give efficient aid. Questions which can only be decided by personal inspection and advisement thus reached solution. A special committee assists the Secretary in directing this part of our work and we feel that it could be extended with great advantage. The sanitary inspection of institutions has also been of good service and aids much in administration and in the correction of structural defects. Written reports are rendered as to all inspections made, and, while not requiring yearly publication, are valuable in guiding the Board in its work. We hope by another year to complete a full inquiry into all State, county, city and township institutions of charity or reform, and to make full report of the same.

THE SEVENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

BY MAJOR ALFRED A. WOODHULL, SURGEON, BREVET LIEUTENANT-COLONEL U. S. ARMY.

TOPICS.

Quarantine.
Cholera.
Diphtheria.
Alcohol and Public Health.
Antisepsis in Maternity Hospitals.
Prevention of the Spread of Epidemic Influenza.
Scarlet Fever, Disinfectant Inunction in.
Malaria.
Immunity from Disease.
Infection Within the Living Body.
Tuberculosis.
Tuberculin.
Actinomycosis.
Anthrax.
Rabies.
Infection of Meat, Milk and other Food.
Infectious Udder Disease of the Cow in Relation to Epidemic Disease in the Human Subject.
On the Relation between Variolous and Vaccine Disease in Animals.
The Etiology of Enteric Fever.
Regulation of Milk-Supply.
Infancy, Childhood and School Life.
Incipient Chorea.
The Working Curve of the Hour for School Children.
Neglected Children of Towns and Cities.
The Broad Irrigation Farms of Croydon.
Insanitary Arrangements in House-Building.
Block Dwellings.
Sewer Ventilation.
Water-Supply.
A Revolving Water Purifier.
Leaking Water Mains.
Housing the Poor.
Disposal of the Dead.
The Relation of Occupation to Disease and Mortality.

To attempt to render in a single paper an intelligible account of the proceedings of this body, would be as reasonable as to offer within the limits of a spelling-book the substance of an encyclopædia. The calibre of any man who should presume either feat would thereby be at once determined. But at the request of the Secretary of the State Board I report a few of the salient points connected with this London convocation, which in the best sense was a congress of nations. Demography is a new word, whose general application may be said to be the science or study of peoples, but for our purposes we may accept Sir Douglas Galton's definition as "The science of statistics applied to questions concerning the social well-being of the people." Hygiene and Demography are, therefore, natural allies.

The attendance was very large, nearly 3,000 tickets having been taken out. The general interest outside of the congress itself was great. This was doubtless very favorably influenced by the conspicuous friendliness and encouragement extended toward the congress by the reigning sovereign and by the heir apparent, both of whom actively interested themselves in its welfare.

Exclusive of the time necessarily given to formal speeches at the opening and the close, there were four days for work; and the congress was broken up into ten sections for convenience of manipulation. There was no general daily address in science, as has been the custom in the medical congresses, but after a short welcome on the first working day by each Section President, in some but not all cases including a brief survey of the field, the reading of papers and their discussion proceeded steadily. From their great number the time for turning them over in debate was often limited, and, as a rule, fifteen minutes was all that could be assigned to a MS. and seven minutes to a speech. Exceptions were properly made in the case of matters of grave importance. On the other hand, printed abstracts of each paper were circulated in the section-rooms, and the most, but not all, of the papers were printed *in extenso* before reading, which facilitated comprehension. The discussion, however, was frequently polyglot. In the nature of the case one section would overlap upon another, for many of the border lines could not be well defined. As a consequence, papers on similar and in some cases on identical subjects, varying only in title, were discussed in different sections. In one sense this was a waste of force; in another, it was of advantage in securing consideration from somewhat different points of view.

QUARANTINE.

There was the usual divergence of views on the subject of quarantine. There was no advocacy of mere detention as such, but the English, as usual, regarded inspection and the isolation and detention of infected persons and enforced sanitation of the country itself as sufficient, while the continental delegates held that each country must suit its local conditions as to admission or exclusion.

CHOLERA.

Prof. Hueppe (Prague) announced that he had by slow instead of rapid changes through cultivation in egg albumen, developed comma bacilli so virulent that they were fatal to guinea pigs in a few hours. (It will be remembered that this has not heretofore been done with the cultivated bacillus.) Dr. Klein (London) still doubted that the comma is the cholera bacillus and questioned its uniform distribution. Dr. Cunningham, he said, in ten typical cases had failed to find it, while in others it was very abundant as nearly pure cultures. Dr. Cunningham had shown such morphological and other differences to exist in bacilli cultivated from cholera material as led him, Dr. Klein, to believe this could not be the same species. The comma bacillus might be found in mucoid material such as occurs in cholera, but it is not limited to cholera cases. Large quantities had been found in the mucous flakes of apes dying with severe diarrhœa, although the disease was not cholera. He had not succeeded in cultivating it, however, but he did believe certain states of the intestine favor the production of a species of organism that may have no connection with cholera. Specimens were shown by the lantern. Prof. Grüber (Vienna) held that these were new forms from one culture due to different conditions. Klein maintained that a different morphology was found in the different flakes, and that the difference was preserved under cultivation.

DIPHTHERIA.

Several carefully prepared papers, including one each by Dr. Abbott, of Massachusetts, and Dr. Hewitt, of Minnesota, opened the discussion on the distribution of diphtheria and its prevention, to which the Section of Preventive Medicine devoted an entire day. The drift of opinion, which was not unanimous, was that this eminently fatal disease does not depend upon bad ventilation, drainage, or water-supply in themselves, but that surface filth without excessive moisture favors Löffler's bacillus, just as subsoil pollution and damp favor Eberth's in enteric fever. Its greater comparative prevalence in rural districts was accounted for by the better care usually taken of urban ground-surface. It was the prevailing opinion that diphtheria depended upon individual infection (some thought through mild and unrecognized cases), but spread through indirect media as well as directly from the sick; that the cause was very persistent, clinging for months or years to clothing and walls; that overcrowding and filth favor it, and that notification of the disease, isolation, and careful disinfection are the means of prevention.

ALCOHOL AND PUBLIC HEALTH.

Every one admitted that the evils following the abuse of alcohol were enormous, but the most direct indictment was that of Dr. Norman Kerr (London), who estimated that 40,000 premature deaths occurred annually from alcohol in the United Kingdom, and double that fatality indirectly from it through accident, violence, starvation, neglect and disease. The money loss to the nation from the premature deaths is 6,260,000 pounds, and the waste from alcoholic disease, above the deaths, is 2,880,000 pounds, in addition to the deaths and non-fatal maladies from indulgence not generally reckoned excessive. To these expenses are to be added those caused by pauperism, the administration of justice, the preservation of order and other causes. In addition are the mental unsoundness, moral disorder and social tumult that must increase with each succeeding generation from the mental impairment and degraded morale following inherited brain degeneration.

Sir Dyce Duckworth thought that, notwithstanding the admitted evils belonging to its train, alcohol is so bound up with our daily life that it cannot be done away with. He believed it desirable for adults, to be taken with food after the day's work is done, in quantities not to exceed an ounce and a half per diem. Children should have none, and chronic drunkards be made to abstain, the foolish and vicious by disgrace and cumulative punishment, and the victims of nervous disease by medical care. He did not trust to secular education or sanitary progress alone, but above all to the spread of the knowledge of God's law and of His fear in the heart.

Several continental speakers thought it impossible to prevent its use, and laid stress on the quality rather than the quantity doing harm.

Prof. Westergaard (Political Economy, Copenhagen) showed that the harm of alcohol did not depend upon its average consumption, but that it fell on those, generally a minority, who consume the bulk of it. One-seventh of the adult deaths in London depend, directly or otherwise, upon alcoholic excess. The annual mortality from delirium tremens ranges from 330 in Belgium and 800 in England to 1,100 in Prussia, and the concomitant disease, poverty, and moral and physical degradation, are incalculable. Professor Westergaard pressed upon medical men the systematic collection of all the data connecting alcohol and disease, to supply complete and trustworthy public education. He laid stress upon stimulating the moral sense, and upon private societies for the suppression of intemperance, and doubted whether recommending pure drink would diminish the vice of drunkenness. He believed that the diminution of the number of bars was much more important than a high-license law, for the first did not necessarily depend upon the second. Where saloons are limited, the sale of drink in groceries should be forbidden. Except where popular opinion made prohibition practicable, he advocated the Gottenburg system as the most effectual for the suppression of intemperance. By it a monopoly of the sale of liquor is given to a company that is only allowed to pay a fixed interest to the shareholders, the surplus going directly to the charitable or municipal institutions. The managers, having permanent salaries, are not tempted to encourage drinking, and the hours are limited. The limitation of hours as well as of the number of bars is very important, and in Norway, where much drunkenness formerly prevailed, the sale of liquor is interdicted from Saturday afternoon to Monday morning, with the most beneficial effect upon the community.

The most of the speakers concurred in regarding repeated inebriety as a disease to be treated *nolens volens*, and ordinary drunkenness as a crime to be punished, and that the popular sense should be educated as to the perils of alcohol as a poison.

ANTISEPSIS IN MATERNITY HOSPITALS.

In European lying-in hospitals, antiseptic precautions have reduced the mortality from 34.21 to 4.96 per thousand; or, within the last ten years the lives of 3,011 mothers have been saved, as a result of experimental scientific research so much derided in certain quarters. (Dr. W. O. Priestley.)

PREVENTION OF THE SPREAD OF EPIDEMIC INFLUENZA.

Dr. Sisley said the disease is contagious, and follows lines of human intercourse. Bathing the eyes of exposed persons with boric acid solution has been followed by immunity; avoidance of infected localities is important; public institutions should be especially protected, and schools should be closed and health officers be notified in the presence of an epidemic.

SCARLET FEVER, DISINFECTANT INUNCTION IN.

Dr. Curgenven advised thymol with essential oils dissolved in oil of eucalyptus being used as an inunction in scarlet fever. Desquamation begins with the disappearance of the rash, and disinfection goes on step by step with it. The falling cuticle is not infectious, the patient may safely associate with others after the tenth day, and after-isolation, as now understood, is unnecessary. The bedding and the room are disinfected by the volatile oils simultaneously with the treatment of the patient. The special preparation thus vouched for is Tucker's Eucalyptus Disinfectant.

MALARIA.

Prof. Laveran (Paris) described the hæmatozoön of malaria including the spherical bodies, the flagellæ, the cruciform and the rosette-like bodies, and exhibited diagrams of them. They may be described thus: (1) Spherical, 1-10 mm. diameter. These adhere to the red blood corpuscles, which become paler as the parasites grow. They are pigmented and have amœboid movements. (2) Flagellæ, sometimes seen in variable numbers on the borders of the spherical bodies when completely developed. They move actively, finally become detached and lose themselves among the red blood corpuscles. (3) Cruciform bodies, cylindrical, with pointed extremities, 8-10 mm. diameter, deeply pigmented and without movement. (4) Rosette-shaped, regularly-segmented bodies, containing a little central pigment. After a time they become spherical and disintegrate. (5) Deeply-pigmented leucocytes, in persons suffering from malaria.

The flagellæ are only demonstrable in fresh blood; the others may be preserved on slides. Paludal blood should be rapidly dried and the specimens fixed by heat, followed by staining with a concentrated solution of methyl-blue or gentian-violet. There may be double staining by successive immersion in concentrated aqueous solutions of eosin and of methyl-blue, the red cells becoming rosy and the leucocytes and parasites blue. Nuclei have been observed in both the spherical and the cruciform bodies. Several varieties of this hæmatozoōn have been described, and similar ones have been found in frogs, lizards, marsh tortoises and birds. In the birds some observers have regarded them as identical with the paludal, but there is a distinction; the cruciform bodies are endo-globular and never become free, and the amœboid movements of the spherical bodies are much less marked in the organism found in birds' blood. The latter has been found in birds in non-marshy regions, and it frequently gives no inconvenience to its host. The inoculation of such blood has given only negative results, nevertheless its study may throw light on obscure points about the true hæmatozoōn of paludism.

These bodies were illustrated by the lantern.

Prof. Celli (Rome) concurred with Prof. Laveran that malaria is of parasitic origin. Prof. Crookshank (London) believed that these bodies were not pathological products of the blood corpuscles, but were animal parasites, and while their relation as the cause of malaria was not proved, their presence in man is an invaluable diagnostic sign.

It is to be remembered, as another speaker observed, that this plasmodium has never yet been found outside of the human body.

Dr. Anderson made an interesting report of the complete freedom from malaria of the island of Mauritius until 1865, when some Chinese coolies arrived with intermittent fever. From that point it spread step by step, but rapidly, until in 1867 the whole island was infected and has since remained so.

This singular experience of Mauritius will be recognized as closely resembling the modern invasion of the Connecticut River valley in Massachusetts, about fifteen years ago.

IMMUNITY FROM DISEASE.

This subject, of the utmost theoretical and practical interest, was discussed through formal papers and orally by a dozen of the foremost bacteriologists of Europe, whose views it is attempted to summarize as follows: Both the phagocytic action of the leucocytes and the bactericidal power of the blood-serum were defended. Until Pasteur introduced preventive inoculation by attenuated virus the only immunity against disease was a previous attack of the disease, vaccination excepted. Then Metchnikoff discovered that the amœboid cells, the leucocytes, inclose and digest foreign tissue including bacteria, thus becoming phagocytes; whereby the microbe perishes very differently from the manner in which it dies under cultivation. The rapidity with which the inoculated microbes, whether derived from the direct virus or by attenuation, are consumed by the leucocytes is a measure of the refractoriness of the animal. There are some diseases, or some animals, in which the microbes remain free where phagocytosis does not occur, and others, as tuberculosis and leprosy, where the bacilli are found in the cells but the most serious results follow. This indicates that there the cells are of insufficient power to accomplish the desired end, and these are susceptible animals.

It remains a question whether immunity is due to the power of the cells to include virulent microbes, or whether it depends on the absorption of virus by them. Sometimes the inclosed microbes enjoy full vitality, and virulent bacilli grow within and escape from the dead leucocytes. At others, where the microbes are beyond the reach of the leucocytes, as in the anterior chamber of a rabbit, they grow freely until the leucocytes migrating thither check them. Why are the cells attracted to the microbes, and why do the leucocytes in some, that is, in susceptible animals, fail to seize them? It is suggested that the leucocytes are attracted to the bacteria by a chemical quality or affinity, and it is believed that the products of the microbes do exert a very marked chemical action on the phagocytes. The more active the proliferation of the virus within the body the more energetic are the poisons it elaborates, and the cells which penetrate the toxic focus are paralyzed and become incapable of interfering with the microbes. Sometimes, as in chicken cholera, the toxine formed is still more virulent and actually repels the leucocytes, so that phagocytes are never found in this disease. But in animals immune by attenuated virus, by a suitable dose of bacterial products, this does not occur. A strong dose attracts phagocytes, already habituated to the products of the microbes, which take up the microbes themselves before they can elaborate any effective toxic material. The critical struggle is therefore at the commencement of the disease; for, if the leucocytes cannot accomplish this at the beginning, later interference would be ineffective, because enough poison would have been produced to paralyze them. Hence, any condition that prevents access of the leucocytes facilitates infection. On the other hand, in such diseases as relapsing fever where crises occurred, the cells destroyed the spirilla in monkeys and there was no second attack; but in man the phagocytes were unable to completely overcome it and a new attack supervened. And in tubercle and leprosy, where the bacilli actually live within the leucocyte and finally destroy it, it would appear that the power of the cell is limited to swallowing the foreign body without digesting it.

On the contrary, it is held by some that the prophylactic substances reside in the animal tissue-juices. These bacteria-killing bodies are designated as (*αλεξειν*, to defend) defensive proteids, and it is a theory that "immunity depends upon substances formed by the metabolism of the animal, rather than that of the microbe, and which are able to destroy either the microbe against which immunity is possessed, or the products upon which their pathogenic action depends."

This does not exclude other factors, and it is probable that in some animals immunity may depend upon other causes. In support of this, it appears that the blood-serum of a rabbit is a culture-medium for the bacillus pyocyaneus; but when a rabbit is made immune against the disease produced by this bacillus, its blood-serum has acquired the power of attenuating or destroying the microbe. Similar results have been attained in other diseases, and, especially in pig typhoid, not only have the microbes been killed by the blood-serum of immune rabbits, but such serum has destroyed the disease. It has also been found that the microbes of diphtheria and tetanus do not pass through the system, as in anthrax. They remain localized, and the deadly poisons they elaborate, absorbed into the system, produce their disastrous effects. For instance, an inoculated guinea pig may develop diphtheritic paralysis long after the last diphtheritic bacillus has disappeared; and practically the same clinical effect can be produced by injecting a minute dose of the poison made by the diphtheritic microbe as by the microbe itself. Scarcely any tolerance can be obtained by successive inoculations with minute doses of the poison generated by the diphtheritic microbe, and there is no prospect of producing immunity in that way; and, further, it would be useless to attack the microbe if the poison already formed remained untouched. But it has been found that while the serum of a diphtheritic immune rabbit has no bactericidal action on the bacillus, it does destroy the poison produced by it, and in this way the disease has been cured in mice and guinea pigs. This has been confirmed in other diseases also.

In determining the nature of the substance upon which this bactericidal quality depends, it was suspected that it was a particular ferment-like proteid, known as cell-globulin B. In the serum of the rat an alkaline proteid having the power to destroy anthrax bacillus was found, and, when injected into mice along with fully-virulent anthrax spores, it prevented their development. Other experiments showed that, in the rat at least, these defensive proteids can be diminished or increased at pleasure by suitable diet, and that the blood-serum may fairly be believed to contain this valuable constituent. In corroboration of this, it may be, Emmerich reports that dysentery and croupous pneumonia in animals could be cured or prevented by subcutaneous or intravenous injections of immune blood, and he believes that, as Fraenkel's diplococcus causes croupous pneumonia, so men can be cured of that disease when proper quantities of chemically-pure blood-serum from immunized animals can be obtained.

In the same direction, Kitasato, of Japan, has shown with Behring that the blood of artificially-immune mice not only renders other mice refractory to tetanus, but cures the disease even after severe tetanic spasms have set in.

The defensive proteids or alexins, in which upon this theory these qualities reside, appear to be ferment-like albuminous bodies, which, in the absence of other physiological tests, Mr. Hankin proposes to divide into two provisional classes, sozins and phylaxins. A sozin (*σώζω*, to preserve) is a defensive proteid that occurs naturally in a normal animal. They have been found in all animals yet examined. A phylaxin (*φυλάξω*, to guard) is a defensive proteid only found in an animal artificially made immune, and which, so far as known, only acts on one kind of microbe or its products. Each may be subdivided into those that act on the microbe itself and those that act on the poison it generates, to be called myco- (*μύκης*, fungus) and toxo- (*τοξικός*, poison) sozins and phylaxins. As these may also be obtained from cells, they do not exclude the phagocyte theory. Metchnikoff, of Paris, and Hankin, of Cambridge, are the respective exponents of the phagocyte and defensive proteid doctrines.

It is probably the case, as Emmerich remarked, that no general theory of immunity can be formulated now. Phagocytosis can be demonstrated beyond a doubt under the microscope, and the experimental work with blood-serum seems to show that other factors than the amœboid operate to induce protection. It is reasonable to suppose that both the cell and the serum play important parts, and that the chemical element is not yet made out. Belonging to this last factor are Klein and Coxwell's experiments on the influence of chloroform upon immunity. Frogs and rats are ordinarily immune against anthrax; but when inoculated with it under chloroform or ether, both of these invariably die, although, so far as the microscope shows, the leucocytes continue to swallow the bacteria. This seems to show that chemical changes may be established in the blood, sufficient to neutralize the destructive power of the leucocytes.

DISINFECTION WITHIN THE LIVING BODY.

A cognate subject to the preceding received discussion by the same section (Bacteriological) on another day.

Behring (Berlin) said in view of Pasteur's and Koch's researches it is conceivable that the germs within the body may be rendered harmless by killing the germs, hindering their growth, counteracting their disease-producing properties, or by destroying their toxic products. And it is possible, although not proved, that increased power of resistance may be bestowed upon cells. A mouse will be killed by the injection of anthrax from another mouse, but chloro-bromate of soda and corrosive sublimate injected at the same place (and within two hours) delays or by its repetition averts death. It is not easy to explain the process. The bacilli are not killed, for they may be cultivated from the blood many hours later; nor weakened, for other mice inoculated with them die typically. A few may be killed by the œdema that occurs, but we have to assume that changes of a general character that hinder their growth have been brought about; otherwise it is difficult to understand why they are not taken up by the blood and lymph as usual. Similar results have been obtained in both tetanus and diphtheria by injecting trichloride of iodine, and in diphtheria by the double salt of gold and sodium and the zinc preparations.

But besides their cure these animals have acquired a certain degree of immunity against the same infection (of disease), and with their blood new therapeutic results have been obtained. There is this difference in the curative effect of the chemicals and the blood, the former only act when injected near the seat of inoculation and within a short period of it; the blood acts when injected in other parts and at late stages of the disease, as for example after tetanic convulsions have set in.

Behring now thinks it possible to render the specific products of diseased organisms within the body harmless by chemical agents, and that a certain degree of immunity is conferred along with the curative effect. This action in immune blood is not dependent upon nor limited to the living elements; for it exists in the cell-free serum, and by it the special diphtherial poison is destroyed without the bacilli being destroyed. From this we may look for some disinfecting agent to destroy the bacteria toxine, and Ehrlich's experiments upon the immunity conferred upon mice and rabbits against the vegetable albumens of the castor-oil plant, confirm this. Tolerance thus seems to be the power of the serum to destroy the active poisons, and indicates a revival of humoral pathology.

To these generalizations, Roux, representing the phagocytic doctrine, objected as setting forth an unproved theory and to chemical action as incomprehensible. Sir Joseph Lister regarded phagocytes as endowed with life and requiring nourishment, while chemical action implied dead rather than living tissue.

Continuing the subject, Ruffer detailed experiments with the bacillus of quarter-evil (b. Chauvoei), and maintained that the fluids of non-immune and of immune animals alike have no power to destroy bacilli; that an extremely weak virus grown in immune fluids, if protected from wandering cells, becomes so intensified as to prove fatal on re-inoculation in the same animal, and that when the leucocytes are prevented reaching the virus in acute infectious diseases, the result is fatal.

In the discussion of *Antiseptics, with Special Reference to Surgery*, Prof. Crookshank strongly recommended carbolic acid 1 to 50 in preference to corrosive sublimate; Prof. Gruber regarded the best agents as carbolic acid, lysol and kresole, and Prof. Hueppe regarded kresole, or a mixture of soluble tar products with sodium salicylate, as very efficient. Each of these spoke, independently, of the ordinary methods of testing surgical disinfectants as untrustworthy.

It follows from all the preceding that, although great practical advances in medicine and surgery have been made and we seem on the threshold of still greater, the theories of immunity and disinfection, of disease and treatment, are by no means settled or agreed upon by the leading students.

TUBERCULOSIS.

A discussion upon tuberculosis, held in joint session of the Sections of Bacteriology and the Relation of the Diseases of Animals to those of Man, showed the sense of the assembly to be that, speaking generally, the infection of tuberculosis is communicated by man to man; that a comparatively small degree of infection follows the ingestion of solid food from tuberculous animals; that when tubercle is not diffused in animals there is a little danger from meat, and that that is minimized by careful cooking, but that milk, either in its natural state or as butter, cheese or buttermilk, from cows with tuberculous udders, is highly dangerous, and is only sterilized by thorough boiling. General confiscation of tuberculous cattle is not considered necessary nor as practicable, in the absence of qualified Inspectors; but the careful cooking of all meat is recommended, the careful examination and supervision of all milch cows and the rejection of all milk from diseased udders is insisted on, and it is thought that milk from several cows is safer than that from one, for children's diet.

(Compare with report on Actinomycosis.)

TUBERCULIN.

A discussion on tuberculin revealed a widespread fear that it might excite general tuberculosis from localized centers. But Prof. Ehrlich asserted that Koch's present results were extremely favorable, and depended on the local effects of very minute doses upon the specially-affected tissues. Large quantities do harm.

ACTINOMYCOSIS,

Which has been carefully studied in recent years, it is believed has frequently been confused with tuberculosis, and especially with a scrofulous condition. It invades not merely the skin and the mouth, but sometimes the respiratory and other internal organs of animals.

The best opinion seems to be that it is not directly communicable, but that the common cause for both animals and man is a fungus connected with cereals used as food. An animal infected with this disease, especially if the internal organs are free, it is believed might be eaten with impunity, and to slaughter infected beasts for the sake of others is not necessary.

It is important to distinguish it from tuberculosis, and in the early stage this can only be done microscopically. The fact that it prevails in Australia, where is has generally been confused with tuberculosis, may have given rise to the report that Australian cattle that have never been housed sometimes are tuberculous.

ANTHRAX.

As in man this disease always comes from animals, the line of defense is, first, protective inoculation of animals, and secondly, the disposal of carcasses and the disinfection or destruction of dangerous animal products.

RABIES.

Roux reported that Pasteur had treated 9,465 persons in 1886–90, of whom 90, or 0.95 per cent., died; or, excluding those where rabies in the animal was not proved, 7,925 cases, with 73, or 0.92 per cent., deaths, against 12 to 14 per cent. mortality of those bitten and not treated. The treatment, which was given in detail, is by using exact quantities of inoculated rabbits' spinal cord, of graduated but known strength, for specified periods. M. Pasteur believes that, beside the modified virus in the cords, special chemical bodies are formed by the rabic microbe, which probably takes part in producing immunity. Cases had been successfully treated long after the bite where hydrophobia was believed to be developing, and it is probable that rabies in dogs had been aborted by vaccination after inoculation. It was doubtful whether all mortality would be overcome, because most of the deaths occur in persons in whom the disease is developing before treatment is begun, and because the virus might remain latent for years and the immunity might disappear first.

Dr. Fleming (London) showed by statistics for many years and countries that rabies is suppressed as muzzling is enforced. (There has been no case in Berlin for eleven years.) This probably depends on the destruction of wandering dogs and the greater care taken of those that are muzzled.

INFECTION OF MEAT, MILK AND OTHER FOOD.

Dr. Ballard (London) cited and agreed with Dr. Buchanan that diseases following the eating of poisonous food are as truly infective and distinct diseases as scarlet fever and tuberculosis. Their symptoms are generally gastro-intestinal, but the causes are specific. It has been only within a comparatively few years that these could be studied except by inference, but now bacteriology opens the way to their investigation. The true cause is the chemical poison generated by some micro-organism that has gained access to the food, and this toxine may be formed either before or after it is eaten. The period of incubation is noteworthy to determine which of these has occurred. The infection reaches the food "accidentally"—that is, under conditions we are not yet able to recognize—but almost invariably in connection with want of cleanliness of vessels or surroundings. This especially is the case when it has been kept in a temperature favorable for germ life. The great preponderance of cases due to pork and veal appears to depend on the relative excess of gelatine, which is so favorite a nutrient for bacilli.

The efficient precautions are, obviously, great cleanliness of the materials and surroundings, abundant light and ventilation, and the avoidance of all contaminated air from the ground or elsewhere.

Dr. Vaughan (Michigan) cited Gartner's epidemic at Jena as illustrating disease due to a pathogenic state of animal food; enteric fever and diphtheria propagated by milk from extraneous conditions, and milk and custard-poisoning, as due to saprophytic, toxigenic bacteria. When disease is localized in the lungs tuberculous meat may convey tubercle, and when the disease is general it is dangerous as food. When the milk glands are affected, infection is probable. He believes much infantile diarrhœa to depend on saprophytic, toxigenic germs that develop chemical poisons, and thinks that the use of sterilized milk, which might be re-infected within the body, less advisable than abstention from all milk for a few days. Investigation should include search for bacterial as well as basic products of putrefaction.

Prof. Brown said it was evidently quite clear that there were microbes having no special morphological structure, which might undergo various changes under cultivation and produce unanticipated effects. (This idea appears under different forms in several sections.)

Prof. Lehmann (Würtzburg) maintained in a paper on *The Hygienic Importance of Copper*, that there was no evidence that from copper vessels as much as 150 to 200 mg. copper had been taken into the system at one time, and that as at least that much was required to produce pathological effects, the true cause of the acute poisoning attributed to copper utensils was the toxalbumens and ptomaïnes. As much as 50 mg. copper daily will not cause chronic copper-poisoning in man, for it is stored in the liver in large quantities and excreted by the bile, the intestines and the kidneys. Too large amounts may cause chronic gastro-intestinal disturbance. Chronic copper-poisoning may be due to careless working in copper, but what is so called is generally to be attributed to other minerals. The addition of copper to bread or vegetables is unnecessary and may be dangerous and should be forbidden. In medical jurisprudence severe copper-poisoning should not be recognized possible unless 200 mg. are consumed, and the bacterial products should be looked for instead.

INFECTIOUS UDDER DISEASE OF THE COW IN RELATION TO EPIDEMIC DISEASE IN THE HUMAN SUBJECT.

Klein contended that scarlet fever, diphtheria and a yet unnamed disease resembling these but distinct from them, were caused by inflammatory diseases of the udder, and cited the Henden, Edinburgh, Yorktown and Croydon epidemics in corroboration. The weight of opinion, especially of the veterinarians, in an animated and prolonged debate, was that he had confused bovine diseases and that there was no ground for his deductions, nor is scarlet fever communicable to the cow.

The importance of udder disease in connection with milk was fully acknowledged, especially when the animal is tuberculous.

ON THE RELATION BETWEEN VARIOLOUS AND VACCINE DISEASE IN ANIMALS.

Prof. Chauveau (Paris) said that while he was now able invariably to communicate small-pox to bovine animals (in which he had formerly failed), he had never been able to transform that virus into vaccine.

THE ETIOLOGY OF ENTERIC FEVER.

A paper of much wider interest than its title implies was read in the Section of Military Hygiene, on *Enteric Fever in Campaigns, its Prevalence and Causation*, by Surg.-Capt. A. M. Davies, Assistant Professor of Hygiene at Netley. Prof. Davies first showed from the records that enteric fever is an almost universal accompaniment of an army in the field in all parts of the world, even in isolated spots not previously occupied, and that diarrhœa and other bowel affections prevail previously to and along with the enteric outbreaks. Then, repudiating the doctrine of spontaneous generation in the sense that anything may arise from nothing, he laid stress on evolution as a factor that may develop from a non-specific germ a disease-cause having special qualities. He quoted as a text the Report of the Principal Medical Officer in the Egyptian Campaign of 1882: "Looseness of the bowels, under the name of camp-diarrhœa, begins to be common almost as soon as any army takes the field. This is in a large number of cases compatible with apparently good health, and is doubtless attributable to the changed conditions of life. Some cases of fever occur, some of very brief duration, which are classified as heat fever, and some attended with diarrhœa, marking the commencement of enteric fever in the force. The development of this disease and the proportions it will assume, will be merely a question of time and circumstances." After citing examples in support, Dr. Davies says: "Now, in the above-quoted instances, either there was a connection between the preliminary diarrhœa prevalence and the subsequent enteric fever prevalence, or there was not. If we believe in the origin of enteric fever purely and simply by specific contagion from a pre-existing case, then no amount of diarrhœa prevalence is of any consequence one way or the other. But, assuming for the moment that there may be causal connection between the two," he traces it as far as possible in this way:

First. "The actual records seem to show a gradual development of definite enteric fever from ordinary diarrhœa, the intervening degrees of feverishness, *malaise, embarras gastrique,* anomalous and ill-defined fever with diarrhœa, apparently being separated from each other by no distinct demarcations."

Secondly. It is more reasonable to expect that the diarrhœa in weakly and exhausted individuals, with an increase of filth and decomposition, polluting soil, air and water, should lead to a development of filth-generated, pathogenic poison, capable of causing in such weakly persons a fever with diarrhœa, a poisoning of the organism, producing pyrexia and inflammation of certain glands of the alimentary tract—in fact, a specific fever. It supposes evolution of a disease-poison under increasing conditions of pollution of soil, air or water, either separately or together, and as such is not unreasonable or illogical. The conditions of camp pollution exist, and frequently tend to increase. Should they have no effect? Why should diarrhœa remain simply diarrhœa under such circumstances, and evolution have no part in it?

Thirdly. Analogy favors such a view. The independent production of the dysenteric poison is doubted by no one. And the dysentery that arises in early camp life will always become contagious and epidemic, unless special precautions are taken. And it is a common occurrence to note the prevalence of "sore throat" without any special diphtheritic character some time before the actual outbreak of diphtheria, which appears to point to the gradual evolution of the specific poison.

Now, accepting the modern belief that there is a specific parasite for each specific contagious disease, and that in enteric fever it is Eberth's bacillus, as is generally believed although not actually demonstrated, Dr. Davies asks, "Is it necessary to believe that each bacillus or group of bacilli that give rise to a case of enteric fever should originate immediately from a pre-existing bacillus or germ of the *same* species, and derived from a pre-existing case of the same disease, or is it conceivable that the bacillus should have developed its specific disease-producing properties from other varieties, or some one other variety of bacillus, by a process of evolution under favoring conditions?"

Probably Eberth's bacillus is causally connected with typhoid fever, but there is no doubt that it is not the only bacillus connected with the disease; but, in the present state of our knowledge, the relationship of the various bacilli met with in enteric patients, although important, is yet unsettled. For instance, MM. Rodet and Roux believe the bacillus coli communis to be really another form of Eberth's bacillus. Notwithstanding differences in the morphological characteristics and in the character of the cultivations, these observers do not think they are such as differentiate them into two distinct species. "Considering, on the one hand, the tolerance which the organism has for the bacillus coli, as it commonly presents itself in the intestine, and, on the other hand, the injurious nature of water contaminated by it, they are led to the conclusion that, in the great majority of cases, it acquires outside the organism its 'typhigenic' character."* Von Babes† believes that, along with Eberth's and the b. coli com., there are many forms furnishing gradations between the typical typhoid bacillus and the common saprogenic bacilli. Dr. Cassedebat‡ has described pseudo-typhoid bacilli resembling, yet differing from typical Eberth's b. Vaughan§ has isolated two bacilli from suspected water which, although presenting cultivation characters different from Eberth's, produced identical lesions and more fatal effects in animals.

From all these, Professor Davies believes not that there is yet *proof* that typhoid bacilli may be developed from other organisms, but that it is a reasonable supposition that will afford a satisfactory account for those outbreaks in camp life hitherto so difficult to explain. As he says, this explanation will account for the great variety of types of enteric fever as dependent upon the degree of development; and that it is not illogical should be allowed, when we bear in mind the extreme rapidity of their propagation. As bacteria will pass through 100 to 1,000 generations, sometimes in a few days, there should be no difficulty in supposing the last may have different qualities from the first, should the environment so determine. Environment is all-important, and the co-existence of filth, decomposing organic matter or fæces, with favorable conditions of temperature and moisture, may reasonably be supposed to so change a micro-organism as to endow it with disease-producing properties, and thus cause the production of a specific poison *de novo.*

So much space has been given to this subject, because it is a matter of daily concern in civil life as well as important in camp. If it is true, it lays new stress on the necessity for sanitary care, and it is the

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***Comptes Rendus de la Soc. de Biologie*, XI, 1890.

†*Zeitschrift für Hygiene*, 1890.

‡*Ann. de L'Institut Pasteur*, Oct., 1890.

§ Phila. Med. News, 1890.

latest and clearest exposition of a doctrine not altogether unique. Besides the authorities quoted by Professor Davies, as already seen, Professor Brown, in the Section on Diseases of Animals (pp. 43–4), suggested that microbes might by cultivation undergo changes that would produce unlooked-for effects, and Professor Arloing (Lyons), in a paper on the *Causation of Enteric Fever*, in the Section of Bacteriology, drew special attention to the etiological role that the b. com. coli might play in enteric epidemics. Rodet and Roux, by comparative study of it and b. Eberth, have not been able to establish decided specific differences between the two bacilli. Their pathogenic properties with regard to animals are apparently (*sensiblement*) the same, and morphologically they become *Eberthiform* in successive cultivations under slight modifying causes. These researches, Arloing remarks, give considerable support to Murchison's theory of pythogenic origin. They allow of the creation of a focus independent of the presence of an antecedent sick person and independent of contaminated water, although these latter cases must be rare. Vallet has proved the b. coli maintains itself in the liquid of fermented matters where b. Eberth cannot be cultivated, and the b. coli from cesspits is more pathogenic for guinea pigs than the b. Eberth from the spleen. Professor Hueppe (Prague) said the chief point of differentiation between the bacilli is the absence of cilia (?) (*cils*) in b. coli com., and he could not admit their identity (*similitude*), unless they take on this character. M. Arloing said these had not been looked for in Lyons.

These views have been foreshadowed in the United States at least by Dr. E. M. Hunt,* of New Jersey, and by the writer.

The writer, in a paper on yellow fever,† said, in 1879: "The germ theory, in its integrity, does not compel belief in an infinitely-extended ancestry of germs, each identical with its predecessor and its successor. We may imagine an infinite variety of self-propagating germs, each set of which gradually yield to adjacent influences, as is conspicuous in the cultivation of vegetables and is shadowed in animal life, and then suppose that with the metamorphoses induced by the surrounding conditions the yellow fever cause is gradually evolved. These presumed changes, although, perhaps, involving many generations of germ life, may easily be accomplished within the period of a single season, and would be developed with a rapidity proportionate to the propitiousness of the situation," &c.

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*See Enteric Fever, Fourth Report N. J. State Board of Health, 1880; The Germ Theory of Health, Med. News, Phila., Oct. 24th, 1885; The Origin of Some Diseases, Trans. Am. Public Health Asso., 1887, Ezra M. Hunt, M.D.

†Am. Pub. Health Reports, V., pp. 104–5.

In so interesting a matter as this, it has seemed worth while to go beyond the record of the congress itself for these references.

REGULATION OF MILK-SUPPLY.

Dr. Ostertag enumerated, with examples, many qualities of milk, including all abnormalities of color, taste and odor, as well as that from diseased animals or milk liable to be contaminated by emanations of any kind, that should be condemned. It was the general opinion that tuberculosis in cows should be a notifiable disease, and there were individual opinions not dissented from that children are better fed on condensed milk, or milk from several cows, than on that from one. The power to close dairies and milk shops supplying infected milk belongs to many English towns, and it was the general opinion that all such establishments should be licensed and inspected.

INFANCY, CHILDHOOD AND SCHOOL LIFE.

This section was chiefly taken up with the relation between children and schools.

The central idea, as indicated in the President's address, was that the exigencies of the day require State intervention in the interest of the community; that the appointments for teaching should be adapted to that end; that observation and independent reasoning should be cultivated along with learning from books; and too little care for the spiritual capacity of the child should not blunt its moral perception and retard its perfect physical development.

An examination of more than 50,000 school children showed more than 41,000 of them to be of normal development. The others were divided into groups, from those of natural appearance but slow to learn, to those deficient in some distinct particular or epileptic. The delicate, feeble-brained children, those with small heads, those nervous and with headache, with chorea, with occasional fits, those partly blind or deaf, conditions not tending to fatal results, are susceptible of modified education and should be provided for, without which there is danger of mental and moral deterioration. In Germany and in Scandinavia such auxiliary classes under special teachers have long been established with the best results, and three such schools are about being opened by the London Board.

The advantages are two-fold; the normal children are not retarded by the incompetent, and those thus handicapped by nature are carried along under the best possible conditions and really attain a better position than if pressed with their superior fellows. The feeling of the section was unanimous that graded and special care of this kind should always be at the disposal of the weaker children, for their own sakes and for the sake of the State. Those positively imbecile or epileptic should also have special training. It was thought that care of this kind bestowed upon such children of the poorer classes would eventually lessen the number of those requiring admission to asylums as lunatics.

INCIPIENT CHOREA

Is generally unrecognized by teachers, and this form of nervous disturbance is frequently punished as inattention. A simple and effectual test is to require the suspected child to hold both arms straight over the shoulders. In commencing chorea the hands will quiver, or will fall backward or forward.

THE WORKING CURVE OF THE HOUR FOR SCHOOL CHILDREN

Was illustrated by Prof. Bergenstein (Vienna), showing how the brain-power fluctuates and manifests fatigue under exercise. The opinion prevailed that three-quarters of an hour is sufficiently long for lessons, and that it should be succeeded by a quarter of an hour's rest. Prof. Kuborn (Leipsic) reported that recent school legislation in Belgium had greatly improved the physique, vision and cerebral power of the children.

Mr. White (London School Board), pointing out the natural desire of children for change and for physical activity, recommended *physical education* as a part of school routine, to occur midway in the time for mental work. The use of apparatus was deprecated as involving too great muscular strain, and stress was laid upon swimming, which the London Board now looks upon as necessary. The paper was illustrated by a band of children under one of the teachers of the London schools, showing exactly how the method is now carried out. It was the opinion of the section that out-of-school study should be minimized, the lessons should be of moderate length and be broken by rest, and that systematic physical exercise should always be introduced.

THE NEGLECTED CHILDREN OF TOWNS AND CITIES,

Especially the deplorable condition of those of drunken and otherwise criminal parents, had a day devoted to them. The moral as well as the physical strain of privation was recognized, and the improvement of children relieved from it was noted. There was a decided feeling that, at least to some degree, children should be removed from under charge of incompetent parents; that the parents themselves should be punished; and that, notwithstanding the risk of diminishing parental responsibility, proper food and clothing should be supplied by the State to the children, either at the school or elsewhere.

SEWAGE DISPOSAL.

The Chemical Section devoted a day to questions of sewage disposal. Dr. Thresh, in a methodical and exhaustive paper, enumerated the nine or ten different methods by which the soluble and insoluble deleterious matters are sought to be disposed of, and was of the opinion that broad irrigation is the only single one that gives any prospect of success. The separate system reduces the handling to the minimum, but the real difficulties continue. Probably a combination of precipitation, subsidence and chemical filtration will form the best method. Electrolysis thus far is only a roundabout way to produce a soluble iron-salt. Sterilization is best accomplished by the Amines process of herring-brine and milk of lime. Filtration rapidly clogs the pores of the filters, and although the micro-organisms may be enormously reduced, they will increase with great rapidity, as the soluble constituents are not affected. Under no circumstances may the effluent pass into a stream furnishing water-supply lower down, until all specific organisms and suspected impurities are removed and the dissolved organic matters minimized.

BROAD IRRIGATION FARMS.

The Broad Irrigation Farms of Croydon were described by Dr. Carpenter, where for thirty years the sewage has been disposed of without injurious effects on the river into which it ultimately flows or to the health and comfort of the surrounding inhabitants. The farms are cultivated to advantage, the crops grown are satisfactory food for man and beast, and the animals so nourished are healthy. The excreta from patients with infectious and epidemic diseases are immediately rendered innocuous in broad irrigation, and sewage kept in motion and quickly brought into contact with soil and vegetable life is changed in a direction contrary to that required for the propagation of germs. The destruction of sewage is as opposed to the national interests as is the destruction of any other form of wealth. The working conditions for successful sewage-farming are that the sewage be kept near the surface, moving over the land rather than downward through it, and it must be kept within the influence of vegetable root-fibrils and of the humus, and underdrainage is not so necessary as some suppose.

English and continental speakers confirmed these statements and described the successful operation of the Paris and Berlin sewage-farms, confessedly modeled after those at Croydon. The expressed opinion of the section was that "the best yet known method of disposing of the sewage of towns is that of purification and utilization on the land."

(The writer visited these farms by the personal invitation of Dr. Carpenter, before the congress. Croydon is a town of nearly 100,000 inhabitants, and the two farms comprise a total of 776 acres. The crops under constant cultivation are rye-grass and mangold-wurtzels. The effluent is perfectly clear and odorless, and fish thrive in the stream that receives it. Dwellings line one border of the farm and a public foot-path traverses it.)

INSANITARY ARRANGEMENTS IN HOUSE-BUILDING.

A practical paper about Insanitary Arrangements in House-Building, by Mr. Statham, discussed the advantage to any house, especially to those in large towns where the air is laden with impurities, to have the materials sufficiently impervious not to absorb, and the construction such as not to retain, dust and its pollutions. He condemned floors with spaces above the subjacent ceilings, dark spaces under the roof, skirtings about the floors, cornices and mouldings to rooms and furniture, windows with sash pulleys, curtains, inclosed tubs and water-closets. He advised impervious walls; if wall-paper is used it should be smooth and of close texture, but hard-finished walls are better; floors preferably of iron and concrete, covered with parquet or terra cotta, but if of timber, to be double, with felt between and the joists exposed below; pipes to be incased with hinged covers, and all dark spaces about the building to be abolished.

BLOCK DWELLINGS.

Mr. Sykes said that block dwellings, such as are required to replace crowded and demolished buildings in cities, are dwellings superimposed with a common stairway. They diminish crowding by giving more light and air with better supervision. There should be a space equal to their height between every two blocks, and the space required for each cube would be twice the length of the side squared ($2 S^2$), and its capacity would be the length of the side cubed (S^3). A cube containing 64,000 cubic feet would require 16, not 64, times the area of square space required by a cube containing 1,000 cubic feet.

Ten feet is a good height for one story, and four or six stories sufficient for the height of the house. The depth of the block and the width of the open space on one side equal the depth of the total space occupied by one block, and this divided into the total depth of the area gives the number of blocks it will support.

The better block buildings are perfectly sanitary. In the Peabody blocks, notwithstanding the age-distribution is less favorable, the death-rate is 2 in 1,000 less, the birth-rate much higher and the infant mortality much lower than for the whole of London. But on account of ease of communication between families, the death-rate between one and five years from scarlet fever, diphtheria, whooping-cough and measles is much higher. The death-rate from enteric fever is one-half that of all London.

DISPOSAL OF SEWAGE.

In a discussion on the disposal of sewage in the Engineering Section, in emphasizing the necessity for continuous chemical and engineering observation of rivers, the course pursued by the State governments in America, where the Boards of Health are composed of experts, was warmly commended as an example to be universally followed.

SEWER VENTILATION.

Mr. Santo Crimp maintained that there is practically no movement of air in sewers due to the difference of temperature and that, as the wind was the only force concerned, the aërial contents of the sewers depended for their motion and direction upon this external agent. Ventilating-pipes should therefore be carried up tall buildings to discharge into the upper atmosphere, and street ventilators should be reduced to the minimum.

Mr. Read was of opinion that the gratings in the street are not ventilators but vents, and that for the production of local currents of air in sewers the inlets at the street-level should be small and at least one hundred yards apart, and the outlets should reach above the roof, and the sum of their sectional area in the distance between a pair of inlets should exceed the sectional area of the sewer. The air will then enter the inlet, flow down the sewer, escape at the outlet and prevent the formation of sewer-gas.

WATER-SUPPLY.

The opinion prevailed that where a double supply was necessary the potable water alone should be in the consumer's hands; that, as the most efficient way to introduce any substance into the body, disease-germs included, is in solution, more reliance should be placed on the original purity of the supply than on attempts at filtration or neutralization. Cases were cited where it was demonstrated that typhoid fever poison had been conveyed through unsuspected underground channels (in chalk) several miles. It was claimed that sand filtration is incomplete as against germs, and that it is possible for them to grow and develop in such filters. In illustration of this last point Mr. Kummel said that Altona received filtered and Hamburg unfiltered water from the Elbe; that in February last Altona had an epidemic of typhoid fever and Hamburg escaped, and that several weeks before the fever appeared the enteric bacilli increased from 50 to 1,500 per cubic centimeter.

M. Maignen (Paris) suggested that the future of water purification is to be chemical.

Prof. Frankland believed there is no self-purification of rivers; that sedimentation takes place in relation to suspended matter; and that while bacilli (of anthrax) are rapidly destroyed by running water, their spores retain their vitality for an indefinite time.

A REVOLVING WATER PURIFIER

Used on a large scale in India, South America, France and England, was described by Mr. Anderson. It consists of a cylinder containing scrap-iron, kept in continuous slow rotation, through which water passes. From one-tenth to one-fifth grain of iron is taken up per gallon and deposited afterwards in sand. Long trial shows organic matter greatly reduced and potable water secured.

LEAKING WATER-MAINS.

Mr. Govesten (Berlin) called attention to the practical point that when there is a fracture or leak in a water-main under ground, the internal pressure may be relied on to keep out foreign matter if the fissure is at a right angle or an oblique angle to the contained flow; but that if it is at an acute angle the greater the speed the greater the suction. This has proved to be the case in practice, when sand has choked the smaller pipes.

DESTRUCTION OF REFUSE BY FIRE.

In the destruction of refuse by fire, Fryer's destructor with Jones' fume cremator was found to be efficient. Ordinarily the difficulty lies in gases being given off and dust escaping after the first burning. These now are destroyed by a second heating to 1,100° to 1,500°. The chimney should not be too narrow nor the current too rapid.

(The writer inspected one of these furnaces that successfully disposes of all the garbage and refuse of a very large London district, in the heart of the town. It does its work thoroughly and apparently without offense.)

HOUSING THE POOR.

The New York method of requiring every dwelling to be certified and registered was commended. Mr. Harvey held, in that connection, that the relation between insanitary dwellings, ill-health and bad morals is closer than between ignorance and crime, and that life and health should never be submitted to the claims of property.

DISPOSAL OF THE DEAD.

An almost unanimous vote in the Section of State Hygiene, after long discussion and ample argument, held that "the cremation of the dead is a rational and hygienic procedure, which is especially called for when death occurs from contagious disease."

It was the nearly unanimous opinion of the same section; when crowded, that a *notification of infectious disease* by both the medical attendant and the householder, as is now the case in England, is important and should be practiced.

RELATION OF OCCUPATION TO DISEASE AND MORTALITY.

Dr. Ogle showed, taking the deaths of clergymen between twenty-five and sixty-five years of age to be a standard of 100, those due to alcohol, as represented by inn-servants, were 397, and that as against a general mortality of men at 1,000, that of liquor dealers was 1,521. The inhalation of irritating dust by cutlers and filemakers carried their mortality to 383 and 396, or four times as great as fishermen's, exclusive of accident; and coal-mining is a curious exception to the rule that labor in heat and dust is dangerous, the miners and agricultural laborers having an almost identical rate from diseases.

As one of the speakers remarked, all the papers in the division of demography had this in common: The awaking that is taking place as to the obligation of one class toward another class.

PRINCETON, N. J., December, 1891.

PHYSICAL EDUCATION AND SCHOOL LIFE.

BY EZRA M. HUNT, M.D.

The relation of the public school and of all educational methods to hygiene and physical culture, is among the most important questions that can command the attention of those whose duty it is to conserve the best interests of the State. It is well recognized that it is the province of statesmanship and of government to foster and develop all material resources which are identified with prosperity, happiness and success. Of these the resource superior and paramount to all is the people. Well-trained men and women, and children who are being rightly trained, constitute the chief wealth—the commonwealth of every State. There is no question of good government and of essential progress more practical than how we are to secure the best physical, mental and moral development of all present or prospective citizens. This always means a primary study of how we are to train children.

In a system of government of which the school forms a radical part, it is a question demanding foremost consideration. What we would have in the life and power of the nation must be put into the schools.

For long, such training was practically regarded as relating to mental and moral discipline. But the sad contrast of lost or restricted physical powers, as manifested in sickness, invalidity and shortening of life, made it apparent that physical education must be given its place with the same precision as that accorded to other departments. It is this that justifies the remark of the Professor of Hygiene and Physical Education in Amherst College, when, as in his last report, he says: "It is increasingly evident that physical education has come here and in pedagogy everywhere, to claim a rightful place and to stay." Formerly the great error was the assumption that the care of the physical nature could safely be left to instinct, to parents and to the natural exercise which is necessarily obtained in life.

However indispensable and real all these are, and however much they avail in the natural conditions of country life, or of intelligent parentage, facts too palpable and oppressive for concealment have shown that disability, unfitness for labor and crippled or shortened lives are too numerous for us to trust to what we call natural vigor. Amid so much that is artificial there are so many embarrassments that our youth would need definite instruction, even if there were not a wide field in the training of the natural.

Every success of the athlete, every achievement of the gymnast, every success in well-developed or well-applied systems of physical education and in instruction in hygiene, have shown that bodies need education, discipline, training, just as much as any other part of our nature. Defects are prevented or remedied as readily as in our moral or mental structure. Development and capacity are secured as real and as essential. Results as declarative and as practically useful are attained. Children are trained into health, into power for use, their incapacities overcome, their capacities enlarged for the welfare of themselves and of the State, as much if not more than in any other educational process. Thus, we get not only better productive power in a material sense, but the best intellectual and moral condition is far more likely to be secured. A true physical education does more to secure self-reliance, mastery of self, behavior, or the having of one's self in possession, than any flights of intellect or mere lectures on morals.

At this stage of progress in educational and to some degree in public sentiment we are not disposed to waste words in inculcating the importance of this great work, but rather desire to present what is being already done in actual teaching and practice and what is feasible to be done in the near future. As examples are much better than precepts, we desire to outline the methods which are actually adopted and to illustrate them by some of their results.

We classify and briefly comment on these as follows:

1. Instruction in hygiene in our schools.

2. Practice in various forms of physical development.

3. Systems of record which serve to prove results or to indicate the choices of method which should be made.

4. Attention to school buildings and their appliances and surroundings.

1. INSTRUCTION IN HYGIENE IN OUR SCHOOLS.

Instruction in hygiene in our schools needs no other enforcement than to say that it should be early and thorough, since it has to do with the first experiences of life in general, and of school life in particular. Much of it is a kind of knowledge that is in very early demand in the formation of habits, and these constitute the earliest part of education. The pupil not only needs to be taught what his physical nature requires, but also to have as much as possible of that kind of discipline which enforces the lessons taught. We have an example of this in the Adelphi, of Brooklyn, where it has been found entirely feasible to provide the children with a simple meal at the noon recess, where not only is the art of eating learned, but the miserable habit of no meal between eight and two and a half o'clock, or after school, is overcome.

We take this as an extreme illustration of numbers of simpler and earlier-taught hygienic habits which should have their formative influence in direct teaching in school life.

While anatomy and physiology have their places, these are only accessory to parts of that higher teaching which has to do with hygiene in the habits, in the home, in the school-room, in the life.

This Board, by its reports and circulars, and its efforts with schools, gave early attention to this matter. The result was the establishment of a department of Hygiene in the State Normal School, conducted by the Secretary long enough to give it some formative character. It is now being developed into larger scope.

Both abroad and in this country this teaching has now taken such definite form as not to leave us without models, especially in the Boston schools, although various crude imitations are still being made. But the minds of teachers are engaged in this direction, and the old pedagogy is sure to give place to the new.

2. PRACTICE IN VARIOUS FORMS OF PHYSICAL DEVELOPMENT.

Practice in various forms of physical development has its great variety in posture, in calisthenics and gymnastics, athletics and almost numberless forms of exercise. The great value of the new ideas consists in the fact that there is a recognition that each organ and each part of the human structure has its demand; that there are methods for giving attention to the weak so as to make it symmetrical with the strong; that the word "exercise" describes a varied and systematized division into parts, and that the scope of practice is far beyond what is conveyed by one single word. Thus we have a whole system based on the training for special kinds of disability, or invalidity; adaptation of modes and of apparatus, not only to particular muscles and sets of muscles, but to different organs and bones and tissues, while in the more general application of methods consideration is given to the relation of physical development to the entire progress of the being in its entirety.

Then we have discussions as to the comparative value of military drill and other gymnastics in developing self-reliance and courageous mastery of self, while such choices of apparatus as those of the Sergeant gymnasiums are not arbitrary, but made on the basis of claimed needs and claimed results. We thus have the varied forms of exercise coming forth, not as mere exhibitions of skill or contest, but as systems elaborated for a definite purpose, that purpose having as its ultimate a preparation for the several duties and contests of human life, including all that prowess and usefulness mean as applied to man as a machine, intended as a potential factor in all his natures, in his symmetrical wholeness, and as a producer for himself, his family and the State.

This idea is well illustrated in the last report (June, 1891) of Professor Edward Hitchcock, of Amherst College, from which we quote as follows:

> "In all the forms of exercise, both indoor and out-of-door, there is a continual disciplinary and scientific system to guide, advise, prescribe and, if necessary, to compel. The college has thus proved that compulsory physical exercise, as she endows and practices it, is no more an anomaly than is any required mental discipline; only, of course, it must be managed with more flexibility and variety of expression than some other departments of college training.
>
> "The object of the department is not to produce an abnormal development of muscles and lungs. Its requirements are of the nature of simple bodily exercises and recreations, in such forms and movements as will keep the body in the best working condition. Thus the plan has been to carry on such a system of physical education as for the great majority may secure at once bodily activity and mental enjoyment; and for the few who need it, direction and opportunity to correct imperfect or belated physical development. This is in

accordance with the aim of the whole college, which is not to endow any department with the power of turning out monsters or prodigies, of body or intellect, but to develop, educate, enlarge and purify the whole man, to make him in the broadest sense holy.

"In accordance with this aim, a prominent thought running through the whole history of the department is, that its work and care belong to every man who comes to college. It has not been the desire to make prodigious athletic records, or to train remarkable gymnasts and athletes *per se;* it has rather been to give all the students the best opportunities for exercise, recreation and sound physical development. To be sure, we mean to make good records and to gain the championships as often as we can, but the department does not hold these out as inducements for all. These more brilliant attainments hold the same relation in our department that the exceptional attainments of other departments hold in their sphere. It is only the few who take prizes in Latin, Greek, mathematics or literature; nevertheless, the prize stimulus, the record, in the literary and scientific work, is, directly or indirectly, an incentive and inspiration to all the college. We do not expect, nor would we urge, every student to strive for these prizes. But the atmosphere, the impulse, the scholarly aroma, that attends the winning of intellectual honors, elevates the whole college constituency. In the same way the well-developed, handsome form of the all-round athlete, his physical powers of endurance and resistence, which will inevitably be imitated as well as admired, are a stimulus of incalculable value to young men.

"Athletic sports and exercise are in natural development of the call of the age for physical education, as well as a progressive attainment from our beginnings thirty years ago. Some evils and excrescences attached to them, of course, but these should be pruned and cut off by judicious treatment. Wè have no cause to cut the tree down to the roots."

3. SYSTEMS OF RECORD.

The adoption of systems of record is another important advance in physical education. It adopts much of the plan that has been usual in anthropometry and in other vital statistics, and illustrates results not merely by experience and general observation, but by accurate measurement of a sufficient number of persons, through sufficient intervals of time and with details of circumstances and surroundings, so as to furnish proof which partakes of the nature of mathematical certainty.

Here again we cannot do better than to pass by similar foreign records and avail ourselves of the illustration of Amherst College as afforded in the remarks and records embodied in its last report. The report heretofore quoted says:

"The physique of students is altered very considerably from what it was in the sixties. This is evident not only to those of us who have numerical data of physical measurements to judge by, but to any casual observer of the two periods.

"The young man now in college has at his entrance less of the simple, flabby, weak appearance than had the young collegian of 1861. He can play foot-ball; he is more ready to stand his ground by his muscle; he is more alert and vigorous in movement. This may be owing in great part to the training he now gets in the preparatory school which he did not get then. But where did this better preparatory training come from? Did not the influence of a successful experiment reach down from the college? If our preparatory schools are doing good work, whence did they derive the idea of it except from the experience of those who have tried the methods? And is it not with the highest institutions that ideas of progress begin, and from them that they reach downward to be utilized by all that are below, even to the common school of the nation?

"There are two facts in our statistical history which illustrate this point. One is the test of actual strength. Almost from the first beginnings of the department we have possessed and used the two well-known and important strength tests known as the 'dip' and the 'pull-up.'

"These show in each individual, with relative certainty, the muscular power of the trunk and the arms. The record of tests with these instruments, applied to all the college, were averaged for the period from 1861–2, and including 1888, with the result that the 'dip' stood at six and the 'pull-up' at nine. For the sake of comparison we have averaged the same items for the past five college years, and find the 'dip' to be 7.1 and the 'pull-up' 9.9; that is, we register a gain of 9 and 8 per cent. respectively.

"Another fact which seems to show the value of physical education to students is found in our record of time lost on the account of sickness. Statistics taken from 1861 to 1865 show that each student, during that period, averaged a loss of 2.18 days annually during term-time from being too sick to study. The records from 1885 to 1889 show an average loss of only 1.75 days, a gain in health of 8 per cent.

"A comparison of the number of deaths in the decennial period of 1861–70, with the number in the decennial period of 1881–90, show a much greater viability in the latter than in the former decade. The deaths during 1861–70, exclusive of those who fell in the war, were 6.1 per cent. of the whole number graduating; the deaths during 1881–90 were 3.4 per cent. of the whole number. This certainly indicates a greater vitality.

"As the result of measurements, carefully collated, we have compiled a series of tables wherein are exhibited what we regard as the standard dimensions of the various parts of the body. Such tables, foreshadowed some six years ago, have not been hastily constructed; investigations made frequently since then have increasingly established their correctness and value.

"The basis of measurement is the height. It may be laid down as an assured principle that, given a certain height, the various bodily dimensions ought to be strictly and uniformly proportional. Accordingly we have specified some sixty different particulars in which the student should test himself. Every student who comes to us is furnished with these tables, wherein he sees in its various items the standard measurement corresponding to his height, and side by side with these his own measurement, agreeing or disagreeing with the standard. From this comparison both the young man and the department have the data for estimating his bodily powers and conditions, wherein he lacks and what are his possibilities of advancement in physical growth and development. This, of course, furnishes the basis of watchfulness and advice on the part of the department and of faithful work and training on the part of the student, attention being given directly to the points where the need exists.

"The results exhibited in the tables are obtained in four different ways, and give, accordingly—1. The average of the whole college; 2. The mean of the whole college; 3. The average of all the men of twenty-one years of age, and, 4. The Percentile Chart. The measurements are recorded essentially in the form adopted by the American Association for the Advancement of Physical Education, in 1887. We give herewith three tables as specimens:

TABLE I.—1890.

TABLE OF MEASUREMENTS OF STUDENTS OF AMHERST COLLEGE.

	AVERAGES OF 2,000 MEASURES.		MEAN MEASURES OF 2,086 STUDENTS.		AVERAGES OF STUDENTS 21 YEARS OLD.		50 Per Cent. of 2,230 Measurements.	Per Cent. of Increase in Class of '91.
	Metric.	English.	Metric.	English.	Metric.	English.		
WEIGHT	*61.2	§134.9	64.0	141.1	63.1	138.8	61.6	3.9
HEIGHT	1,725	67.9	1,720	67.7	1,726	67.9	1,724	0.6
" Sternum	1,410	55.5	1,410	55.5	1,407	55.3	1,410	0.7
" Navel	1,030	40.6	1,028	40.8	1,025	40.4	1,029	1.2
" Pubes	860	33.9	860	33.9	864	34.0	864	3.3
" Knee	476	18.7	480	18.9	477	18.7	476	0.4
" Sitting	908	35.5	910	35.8	908	35.5	905	1.3
GIRTH, Head	572	22.5	570	22.4	572	22.5	569	0.5
" Neck	349	13.8	350	13.8	356	14.0	351	2.5
" Chest, repose	880	34.6	880	34.6	892	35.1	884	3.0
" Chest, full	927	36.5	925	36.4	933	36.7	925	1.0
" Belly	724	28.5	720	28.3	725	28.5	730	4.1
" Hips	893	35.1	890	35.0	898	35.3	893	2.4
" Right Thigh	517	20.3	515	20.2	521	20.5	514	3.0
" Left Thigh	512	20.1	510	20.1	519	20.4	510	3.1
" Right Knee	361	14.2	360	14.2	359	14.1	359	0.8
" Left Knee	359	14.1	360	14.2	358	14.1	359	1.1
" Right Calf	359	14.1	359	14.1	350	13.8	347	2.8
" Left Calf	349	13.8	350	13.8	348	13.7	345	2.8
" Right Instep	245	9.6	240	9.4	244	9.6	242	0.8
" Left Instep	242	9.5	240	9.4	243	9.6	241	0.8
" Upper Right Arm	257	10.1	256	10.1	264	10.3	259	6.3
" U. R. A., contracted	295	11.6	295	11.6	301	11.8	295	6.4
" Upper Left Arm	253	9.9	250	9.8	259	10.2	252	7.8
" Right Elbow	251	9.8	250	9.8	253	9.9	250	3.5
" Left Elbow	247	9.7	250	9.8	249	9.8	247	3.5
" Right Forearm	267	10.5	270	10 6	266	10.5	262	3.3
" Left Forearm	261	10.2	260	10.2	259	10.2	256	3.1
" Right Wrist	166	6.5	165	6.5	166	6.5	165	0.0
" Left Wrist	165	6.5	165	6.5	165	6.5	163	0.6
BREADTH, Head	155	6.1	154	6.1	155	6.1	153	0.6
" Neck	108	4.2	110	4.3	109	4.3	108	1.8
" Shoulders	430	16.9	430	16.9	431	16.9	433	3.6
" Nipples	198	7.8	200	7.9	200	7.9	196	6.4
" Waist	250	9.8	250	9.8	256	10.1	253	3.4
" Hips	323	12.7	320	12.6	327	12.9	325	1.8
Right Shoulder Elbow	373	14.7	370	14.6	374	14.7	373	1.1
Left Shoulder Elbow	371	14.6	370	14.6	374	14.7	371	0.8
Right Elbow Tip	461	18.1	460	18.1	462	18.1	461	1.5
Left Elbow Tip	459	18.1	460	18.1	459	18.1	459	1.5
LENGTH, Right Foot	260	10.2	260	10.2	261	10.2	260	1.1
" Left Foot	259	10.2	260	10.2	260	10.2	260	1.1
STRETCH OF ARMS	1,780	70.1	1,770	69 7	1,794	70.6	1,789	1.3
HORIZONTAL LENGTH	1.732	68.2	1,730	68.1	1,738	68.4	1,739	0.6
STRENGTH, of Lungs	*1.5	§3.30	1.2	2.64	1.41	3.10	1.4	27.3
" Back	*137	§302	150	330	146	321	139	24.0
" Chest dip	†6.0	....	4	....	7.3	....	6	33.0
" Chest pull-up	†9.0	....	10	....	10.2	....	9	20.5
" Legs	*166	§365	175	385	172	378	169	26.0
" Right Forearm	*41.5	§91	40	88.2	41.5	91.3	39	23.7
" Left Forearm	*38.1	§84	37	81.6	39.5	86.9	37	15.6
Capacity of Lungs	‡3.77	‖230	3.90	238	4.23	250	3.89	4.0

*Kilos. †Units. ‡Litres. §Pounds. ‖Cubic inches. All others, millimeters and inches and tenths.

TABLE II.—1890.

TABLES SHOWING PHYSICAL GAINS OF STUDENTS IN AMHERST COLLEGE DURING A PART AND DURING THE WHOLE OF THE COLLEGE COURSE.

	GAIN OF TWO YEARS' CLASS.		GAIN OF FOUR YEARS' CLASS.		Per Cent of Increase in Class of '91.	
	Metric.	English.	Metric.	English.		
WEIGHT	*2.6	§5.72	5.40	11.8	8.9	WEIGHT, 8.9
HEIGHT	11	.48	16	.68	0.6	HEIGHT, 2.72
" Sternum	8	.11	11	.48	0.7	
" Navel	4	.15	9	.35	1.2	
" Pubes	8	.31	5	.19	3.8	
" Knee	4	.15	12	.47	0.4	
" Sitting	14	.55	18	.7	1.8	
GIRTH, Head	5	.19	7	.27	0.5	GIRTH, 2.72
Neck	10	.39	14	.55	2.5	
Chest, repose	14	.55	41	1.61	3.0	
" Chest, full	9	.35	34	1.33	1.0	
" Belly	10	.39	41	1.61	4.1	
" Hips	15	.59	36	1.41	2.4	
" Right Thigh	19	.74	24	.94	3.0	
" Left Thigh	13	.51	25	.98	3.1	
" Right Knee	4	.15	6	.23	0.8	
" Left Knee	3	.11	7	.27	1.1	
" Right Calf	9	.35	13	.51	2.8	
" Left Calf	11	.43	10	.39	2.8	
" Right Instep	2	.07	8	.31	0.8	
" Left Instep	2	.07	9	.35	0.8	
" Upper Right Arm	13	.51	13	.51	6.3	
" Upper Right Arm, contracted	11	.43	17	.66	6.4	
" Upper Left Arm	14	.55	16	.62	7.8	
" Right Elbow	6	.23	6	.23	3.5	
" Left Elbow	6	.23	5	.19	3.5	
" Right Forearm	4	.15	5	.19	3.3	
" Left Forearm	3	.11	6	.23	3.1	
" Right Wrist	1	.08	2	.07	0.0	
" Left Wrist	2	.07	3	.11	0.6	
BREADTH, Head	1	.03	3	.11	0.6	BREADTH, 2.93
" Neck	2	.07	4	.15	1.8	
" Shoulders	11	.43	19	.74	3.6	
" Nipples	7	.27	13	.51	6.4	
" Waist	2	.07	9	.35	3.4	
" Hips	2	.07	11	.43	1.8	
Right Shoulder Elbow	3	.11	4	.15	1.1	
Left Shoulder Elbow	2	.07	4	.15	0.8	
Right Elbow Tip	2	.07	10	.39	1.5	
Left Elbow Tip	2	.07	6	.23	1.5	
LENGTH, Right Foot	2	.07	5	.19	1.1	
" Left Foot	1	.03	4	.15	1.1	
STRETCH OF ARMS	19	.74	24	.94	1.3	
HORIZONTAL LENGTH	14	.55	20	.78	0.6	
STRENGTH, of Lungs	*.30	§.66	.64	1.41	27.8	STRENGTH, 25.81
" Back	*2.8	§61.7	28	61.7	24.0	
" Chest dip	†2.6	....	2.8	....	38.0	
" Chest pull-up	†1.1	....	1.2	....	20.5	
" Legs	*33	§72.7	37	81.5	26.0	
" Right Forearm	*5	§11.0	7	15.4	23.7	
" Left Forearm	*5	§11.0	5	11.0	15.6	
Strength	*78	§160.9	82	180.8	26.9	
Capacity of Lungs	‡1.2	‖78.2	3.6	219.6	4.0	CAPACITY, 4.00

A total average gain of 5.87 per cent.

* Kilos. † Units. ‡ Litres. § Pounds. ‖ Cubic inches. All others, millimeters and inches and tenths.

TABLE III.

AN ANTHROPOMETRIC TABLE CONSTRUCTED ON THE PERCENTILE METHOD.

Compiled from 2,230 Measurements of Amherst College Students between 1884 and 1891. Arranged According to the Percentage as Indicated at the Left. The Roman Figures Indicate Millimeters, Kilograms, Litres and Units; the Italic Figures Linear Inches, Pounds and Cubic Inches. The Average Age of the Individuals Observed is 20 Years and 4 Months.

PER CENT.	WEIGHT.	HEIGHT.						GIRTH.																						
		Height.	Sternum.	Navel.	Pubes.	Knee.	Sitting.	Head.	Neck.	Chest, repose.	Chest, full.	Belly.	Hips.	Right Thigh.	Left Thigh.	Right Knee.	Left Knee.	Right Calf.	Left Calf.	Right Instep.	Left Instep.	Upper Right Arm, contracted.	Upper Right Arm.	Upper Left Arm.	Right Elbow.	Left Elbow.	Right Forearm.	Left Forearm.	Right Wrist.	Left Wrist.
5	51.0	1,625	1,319	952	795	432	853	545	324	805	843	664	829	463	459	329	330	314	318	224	224	258	227	221	229	224	239	230	153	151
	112.4	*64.1*	*52.0*	*37.5*	*31.3*	*17.0*	*33.6*	*21.5*	*12.8*	*31.7*	*33.2*	*26.1*	*32.6*	*18.2*	*18.0*	*12.9*	*13.0*	*12.3*	*12.3*	*8.8*	*8.8*	*10.1*	*9.0*	*8.7*	*9.0*	*8.8*	*9.4*	*9.1*	*6.0*	*6.0*
10	53.4	1,647	1,339	970	812	442	866	550	330	823	861	675	842	474	470	335	336	320	320	229	228	265	234	229	233	229	243	237	156	154
	117.7	*64.9*	*52.8*	*38.2*	*32.0*	*17.4*	*34.1*	*21.6*	*13.0*	*32.4*	*33.9*	*26.6*	*33.2*	*18.7*	*18.5*	*13.2*	*13.3*	*12.6*	*12.6*	*9.0*	*9.0*	*10.4*	*9.2*	*9.0*	*9.2*	*9.0*	*9.5*	*9.4*	*6.1*	*6.0*
20	55.9	1,674	1,368	992	829	453	879	556	338	844	884	690	859	487	482	342	344	329	329	232	232	275	242	237	239	234	250	242	159	158
	123.2	*65.8*	*53.7*	*39.1*	*32.6*	*17.8*	*34.6*	*21.9*	*13.3*	*33.2*	*34.7*	*27.2*	*33.8*	*19.2*	*19.0*	*13.5*	*13.5*	*12.9*	*12.9*	*9.1*	*9.1*	*10.8*	*9.5*	*9.4*	*9.4*	*9.2*	*9.8*	*9.5*	*6.3*	*6.2*
30	57.8	1,692	1,380	1,007	842	461	888	560	342	859	900	704	874	496	492	349	349	336	335	237	236	283	249	241	244	239	255	249	161	160
	127.4	*66.6*	*54.3*	*39.6*	*33.2*	*18.1*	*34.9*	*22.0*	*13.5*	*33.9*	*35.4*	*27.7*	*34.4*	*19.5*	*19.4*	*13.7*	*13.7*	*13.2*	*13.2*	*9.3*	*9.3*	*11.1*	*9.7*	*9.5*	*9.5*	*9.4*	*10.0*	*9.8*	*6.3*	*6.3*
40	59.9	1,710	1,399	1,019	854	469	897	564	348	870	913	718	882	505	500	353	354	341	340	240	239	289	253	248	249	242	259	252	163	161
	132.0	*67.3*	*55.1*	*40.1*	*33.6*	*18.4*	*35.3*	*22.2*	*13.7*	*34.3*	*35.9*	*28.3*	*34.7*	*19.9*	*19.7*	*13.9*	*14.0*	*13.5*	*13.4*	*9.4*	*9.4*	*11.4*	*9.9*	*9.7*	*9.8*	*9.5*	*10.2*	*9.9*	*6.4*	*6.3*
50	61.6	1,724	1,410	1,029	864	476	905	569	351	885	925	730	893	514	510	359	359	347	345	242	241	295	259	252	250	247	262	256	165	163
	135.8	*67.8*	*55.5*	*40.5*	*34.1*	*18.7*	*35.6*	*22.4*	*13.8*	*34.8*	*36.4*	*28.7*	*35.1*	*20.2*	*20.1*	*14.1*	*14.2*	*13.7*	*13.6*	*9.5*	*9.5*	*11.6*	*10.3*	*9.9*	*9.8*	*9.7*	*10.3*	*10.1*	*6.5*	*6.4*
60	63.5	1,739	1,422	1,040	874	483	913	571	257	897	940	740	904	522	519	362	363	352	351	246	245	300	265	259	255	250	267	266	108	165
	140.0	*68.5*	*56.0*	*40.9*	*34.5*	*19.0*	*35.9*	*22.5*	*14.1*	*35.3*	*37.0*	*29.1*	*35.5*	*20.6*	*20.4*	*14.3*	*14.3*	*13.8*	*13.8*	*9.6*	*9.6*	*11.8*	*10.5*	*10.3*	*10.1*	*9.8*	*10.4*	*10.2*	*6.6*	*6.5*
70	65.4	1,756	1,439	1,057	886	490	921	577	360	910	951	752	915	531	529	368	369	359	356	250	249	308	270	264	259	254	270	264	169	168
	144.1	*69.1*	*56.7*	*41.6*	*34.8*	*19.3*	*36.2*	*22.7*	*14.2*	*35.8*	*37.5*	*29.6*	*36.0*	*20.9*	*20.8*	*14.5*	*14.5*	*14.1*	*14.0*	*9.8*	*9.7*	*12.1*	*10.7*	*10.5*	*10.3*	*10.0*	*10.6*	*10.5*	*6.6*	*6.6*
80	67.9	1,776	1,454	1,070	899	499	930	581	369	925	970	769	929	542	539	373	372	364	362	255	253	315	277	270	262	259	275	269	171	170
	149.6	*69.9*	*57.3*	*42.1*	*35.3*	*19.6*	*36.6*	*22.8*	*14.6*	*36.4*	*38.2*	*30.3*	*36.5*	*21.4*	*21.2*	*14.7*	*14.7*	*14.3*	*14.3*	*10.0*	*9.9*	*12.4*	*10.9*	*10.7*	*10.3*	*10.3*	*10.9*	*10.6*	*6.7*	*6.7*
90	71.8	1,804	1,480	1,093	919	512	943	588	377	949	992	794	948	559	556	380	380	374	371	260	260	327	286	280	269	264	281	275	175	174
	157.0	*71.1*	*58.3*	*43.0*	*36.1*	*20.2*	*37.1*	*23.2*	*14.9*	*37.3*	*39.1*	*31.2*	*37.3*	*22.0*	*21.9*	*15.0*	*15.0*	*14.7*	*14.6*	*10.2*	*10.2*	*12.9*	*11.2*	*11.0*	*10.5*	*10.5*	*11.0*	*10.9*	*6.9*	*6.8*
95	74.3	1,827	1,500	1,109	936	523	951	593	384	969	1,010	814	962	571	569	388	388	381	380	267	265	335	292	288	274	270	289	280	179	177
	163.7	*71.9*	*59.1*	*43.6*	*36.8*	*20.6*	*37.5*	*23.3*	*15.1*	*38.1*	*39.8*	*32.1*	*37.9*	*22.5*	*22.3*	*15.3*	*15.3*	*15.0*	*15.0*	*10.5*	*10.4*	*13.2*	*11.5*	*11.3*	*10.7*	*10.6*	*11.3*	*11.0*	*7.0*	*7.0*

TABLE III.—Continued.

AN ANTHROPOMETRIC TABLE CONSTRUCTED ON THE PERCENTILE METHOD.

Compiled from 2,290 Measurements of Amherst College Students between 1884 and 1891. Arranged According to the Percentage as Indicated at the Left. The Roman Figures Indicate Millimeters, Kilograms, Litres and Units; the Italic Figures Linear Inches, Pounds and Cubic Inches. The Average Age of the Individuals Observed is 20 Years and 4 Months.

PER CENT.	WEIGHT.	BREADTH.										LENGTH.				STRENGTH.								CAPACITY OF LUNGS.
		Head.	Neck.	Shoulders.	Waist.	Hips.	Nipples.	Right Shoulder Elbow.	Left Shoulder Elbow.	Right Elbow Tip.	Left Elbow Tip.	Right Foot.	Left Foot.	Stretch of Arms.	Horizontal Length.	Lungs.	Back.	Chest Dip.	Chest Pull-up.	Legs.	Right Forearm.	Left Forearm.	Total.	
5	51.0	145	99	393	230	301	173	345	348	428	427	242	241	1,670	1,637	0.7	99	0	3	112	28	26	309	2.93
	112.4	*5.7*	*3.9*	*15.5*	*9.1*	*11.8*	*6.8*	*13.6*	*13.5*	*16.8*	*16.8*	*9.5*	*9.4*	*65.7*	*64.5*	*1.54*	*218*	......	......	*247*	*61.7*	*57.3*	*681*	*178.7*
10	53.4	147	101	402	235	306	178	351	351	436	434	246	245	1,696	1,659	0.8	104	1	4	124	30	29	339	3.16
	117.7	*5.8*	*4.0*	*15.8*	*9.3*	*12.0*	*7.0*	*13.8*	*13.8*	*17.1*	*17.0*	*9.7*	*9.6*	*66.7*	*65.3*	*1.76*	*229*	......	......	*273*	*66.1*	*63.9*	*748*	*192.7*
20	55.9	149	103	413	240	313	184	359	357	445	444	251	251	1,725	1,687	1.0	117	2	6	139	33	31	374	3.38
	123.2	*5.9*	*4.1*	*16.3*	*9.5*	*12.3*	*7.2*	*14.1*	*14.0*	*17.5*	*17.5*	*9.9*	*9.9*	*67.9*	*66.3*	*2.20*	*258*	......	......	*306*	*72.8*	*68.3*	*825*	*206.2*
30	57.8	150	105	421	245	317	189	364	363	451	449	254	254	1,749	1,709	1.1	124	3	7	149	35	33	406	3.57
	127.4	*5.9*	*4.2*	*16.6*	*9.7*	*12.5*	*7.3*	*14.3*	*14.3*	*17.8*	*17.7*	*10.0*	*10.0*	*68.8*	*67.2*	*2.42*	*273*	......	......	*328*	*77.2*	*72.8*	*892*	*217.7*
40	59.9	152	107	427	249	321	192	369	367	456	454	257	257	1,769	1,723	1.2	130	4	8	157	37	35	431	3.71
	132.0	*6.0*	*4.2*	*16.8*	*9.3*	*12.7*	*7.6*	*14.5*	*14.4*	*18.0*	*17.9*	*10.1*	*10.1*	*69.6*	*67.8*	*2.64*	*287*	......	......	*346*	*81.6*	*77.2*	*950*	*226.3*
50	61.6	153	108	433	253	325	196	373	371	461	459	260	260	1,789	1,739	1.4	139	6	9	169	39	37	453	3.89
	135.8	*6.0*	*4.3*	*17.0*	*10.0*	*12.8*	*7.7*	*14.7*	*14.6*	*18.2*	*18.1*	*10.3*	*10.3*	*70.4*	*68.4*	*3.08*	*306*	......	......	*373*	*86.0*	*81.6*	*999*	*237.3*
60	63.5	154	110	439	257	329	200	377	375	466	465	263	263	1,808	1,750	1.5	149	7	10	175	41	39	479	4.03
	140.0	*6.1*	*4.3*	*17.2*	*10.1*	*13.0*	*7.9*	*14.9*	*14.8*	*18.3*	*18.3*	*10.3*	*10.3*	*71.2*	*68.9*	*3.30*	*323*	......	......	*385*	*90.4*	*86.0*	*1,056*	*245.8*
70	65.4	156	111	445	261	333	204	382	380	472	471	266	266	1,829	1,769	1.6	150	8	11	184	43	41	507	4.22
	144.1	*6.1*	*4.4*	*17.5*	*10.2*	*13.1*	*8.0*	*15.0*	*15.0*	*18.6*	*18.5*	*10.5*	*10.5*	*72.0*	*69.6*	*3.52*	*331*	......	......	*406*	*94.8*	*90.4*	*1,117*	*257.4*
80	67.9	158	113	451	266	338	209	388	387	478	476	270	270	1,850	1,789	1.7	160	10	12	199	46	43	542	4.42
	149.6	*6.2*	*4.4*	*17.7*	*10.4*	*13.3*	*8.2*	*15.3*	*15.3*	*18.8*	*18.7*	*10.6*	*10.6*	*72.8*	*70.4*	*3.64*	*353*	......	......	*439*	*101.4*	*94.8*	*1,194*	*269.6*
90	71.3	161	116	461	274	345	217	397	395	486	485	275	275	1,886	1,820	2.0	178	12	14	219	50	47	594	4.69
	157.0	*6.3*	*4.5*	*18.1*	*10.8*	*13.6*	*8.6*	*15.6*	*15.6*	*19.1*	*19.1*	*10.8*	*10.8*	*74.2*	*71.7*	*4.40*	*393*	......	......	*483*	*110.2*	*103.6*	*1,310*	*286.1*
95	74.3	163	119	468	281	352	222	403	402	494	492	279	279	1,910	1,841	2.2	194	14	16	238	53	50	644	4.95
	163.7	*6.4*	*4.7*	*18.4*	*11.1*	*13.9*	*8.8*	*15.9*	*15.8*	*19.4*	*19.4*	*10.9*	*10.9*	*75.2*	*72.4*	*4.85*	*428*	......	......	*525*	*116.8*	*110.2*	*1,420*	*301.9*

"We are looking out with zealous and scrutinizing eyes for the best conditions and advantages to the young men under our charge, that they may be fitted to make the highest possible attainments for the citizenship, the scholarship, the Christian vigor for the days to come. To this end, while the intellectual and spiritual remain paramount, yet, in order that these may have their true development, the physical man needs to be brought up to and kept in its highest normal condition. It is with this physical preparation, subordinate it may be, but still noble and worthy, that the department has to do."

Here we have both method and results highly suggestive for all our normal schools and for all of our public schools and colleges. The time has come when all educators, in the interests of common education, must have their attention turned, not merely to the importance of the theme, but to definite practical methods of physical education.

We refer thus much to Amherst College because of the notable example it has set this many years of a real *Department* of Physical Culture. The Instructors are Edward Hitchcock, M.A., M.D., Professor of Hygiene and Physical Education; Hiram H. Seelye, M.A., M.D., Instructor in Physical Education; Frank A. Delabarre, B.A., Lincoln Fellow in Hygiene and Physical Education, and Charles L. Upton, Lincoln Fellow-Elect.

4. ATTENTION TO SCHOOL BUILDINGS, THEIR APPLIANCES AND SURROUNDINGS.

Our fourth item is most important. When, as a matter of public policy, and for their own good, we assemble the children of the State in free schools, it goes without the saying that these places should be divested of all conditions and circumstances which imperil health. Nay, more, they should be up to the standard of best hygienic conditions and aid to develop the child in the best physical life. What this means for the growth, the eyes and the other senses, the lungs, the stomach, and other internal organs, for the skin and muscles and for the body in its holiness, *i. e.* wholeness, seems to be very feebly realized by some teachers, some parents, some trustees.

It is first important that the location and construction of the building be in accord with the number and needs of the pupils. We are glad to know that large attention has been given to this subject by the Hon. E. O. Chapman, Superintendent of Public Instruction, and that we now have in the State models of smaller and larger school buildings which should be studied by Boards of Education and Trustees of School Districts. There is no longer any excuse for erecting buildings on the notion of this or that intelligent citizen. Definite plans should be chosen, after due consultation, and such as have the approbation of the Superintendent of Schools or other school authorities.

We refer to the following specimens and furnish cuts, plans and descriptions as follows:

SPECIFICATIONS TO ACCOMPANY PLAN NO. 7 (CLASS 2.)

(Being School-House at Notch Road, near Paterson, N. J., page 75.)

Specification of Work and Materials for the erection and completion of a School-House in accordance with this specification and the accompanying drawings as furnished by MR. C. POWELL KARR, Architect, Room 217, Stewart Building, New York City.

Estimated Cost, $2,500.

GENERAL DESCRIPTION.

This building is to be so situated as to face the south with its main front.

GENERAL NOTES AND CONDITIONS.

Reference shall be made to drawings for the above, together with the arrangement of rooms and general finish. The drawings are to be considered as a part of this specification and should correspond in every particular.

Should any discrepancy appear in the figure and scale measurements or between the wording of the specification and the lettering on the drawings, the figures on the drawings and the wording of the specification shall in all cases exhibit the true intent and meaning of the design and specifications.

All materials to be of the best quality of their kind, unless otherwise specified. The contractor is to give his personal attention to the work, or have a competent foreman in charge. All work to be performed in a manner satisfactory to the architect. Any portion of the work done by the contractor of a quality not approved by the architect shall be forthwith removed by and at the expense of the contractor, and replaced by him in a proper and satisfactory manner. No part of the work to be sublet without the consent of the owner or his representative.

When it is necessary to cut or change the work of one mechanic in the placing of the work of another, then the said cutting must be done by the mechanic whose work has been changed or cut, the service rendered to be paid for by the mechanic whose work made the cutting necessary.

MASON'S WORK.

EXCAVATION.

Excavate for eighteen piers, six feet below the highest point of ground which the building covers, making excavations for each pier two feet six inches by three feet. Refill about piers. Clear away all rubbish and leave the ground in good order. Excavate a blind drain at or near the four corners of the main building for the reception of the rain-water from the roof. The said drain excavation need not exceed a depth of four feet, nor be more than a foot in width, but it must extend in a direct line away from the building a distance of not less than twelve feet. The bottom of said blind drain must be covered with broken stone or refuse brick or clean gravel to a depth of not less than eighteen inches, and the remaining part filled to grade line with the excavated material.

FOUNDATIONS.

All lime used to be of first quality, equal to Rockland or Williamsville, Erie Co., N. Y. All cement to be equal to Akron Obelisk, Norton's Rosendale or New York & Rosendale "Bridge Brand." All sand to be clean, sharp and coarse. Every pier to begin with a properly-laid footing course, continued for at least two courses. The first course to be twelve inches wider on all sides than the neat regular cross-section of the pier. This first course is to be laid on broken stone filling deposited dry and rammed to a level. Said filling in every case to be not less than two feet in depth, the full width of the excavation.

WALLS.

Bed the sills of the building on the piers in cement mortar one-to-one.

BRICKWORK.

Build eighteen piers, as per dimensions shown on sheet number six (6), four feet in height, of hard-burned brick laid in cement mortar, composed of one part of sand to one part of cement, by measure. Lay the first course of brick, all headers, upon broken stone, to the depth of two feet and rammed carefully to a level the full width of the pier excavation.

CHIMNEY.

Build chimney, as shown on drawings, of hard-burned brick, laid in lime mortar, each brick being thoroughly wet before being set; header courses being laid every tenth course; foundation courses, for first ten courses, being laid in cement mortar one-to-one.

Smoke flue of chimney to be of galvanized iron twelve inches diameter, extending to apex of chimney and surmounted by a "globe" ventilating cowl to fit the same as indicated in the drawings; all joints in the interior faces to be neatly struck.

Provide and set iron thimbles and covers for smoke flue, and one of Tuttle & Bailey's plain black japanned registers for the ventilating thimble.

Chapter of chimney to be roofed on the inside of the bell-shaped hood with two-inch slate flagging or half-inch iron plate; if flags are used the joints must be pointed with cement; if iron is preferred, the plate must be well dipped in boiling tar; in either case the aperture for the admission of the smoke flue must be neatly cut and the fitting done in the most workmanlike manner; the said roofing to be laid just above the square and arched openings provided for the exit of foul air, as shown on detail drawing, sheet number ten (10).

PLASTERING—TWO-COAT WORK.

Lath and plaster in best manner the walls and ceiling of the school-room and teachers'-room, carrying the plaster to the floor everywhere, lath to be seasoned pine or spruce, laid three-eighths inch open, breaking joint every six courses, and over all door and window heads; the first coat of plaster to be of extra Williamsville or Rockland lime and clean-washed, sharp, and coarse white sand well mixed with long hair.

The lime to be slaked separately at least seven days before mixing the sand and the hair; the first coat to be well troweled, straightened with a straight-edge, made perfectly true and brought well up to the grounds.

Skim coat to be made of extra New York State lime, slaked at least seven days before mixing, and washed beach sand and well floated.

Point up with lime and hair mortar around window and door frames, patch up and repair all plastering at the completion of buildings and leave all surfaces in good order.

CARPENTER'S SPECIFICATIONS.

SCANTLINGS.

Sills four by eight inches and six by eight inches, halved and spiked at angles.

Plates four by four inches.

Corner posts four by six inches.

Window studs four by three inches.

Door studs four by four inches.

All other studs two by four inches, sixteen inches center to center, girts four by five inches, mortised to corner posts, if used.

Main girder four by twelve inches.

Floor beams in large room two by ten inches.

Floor beams in all other rooms two by eight inches, sixteen inches center to center, notched down four inches on sill and one inch on girder, rafters two by six inches, two feet on centers, every pair of rafters to be tied as shown collectively on the various sheets of framing plans, with one and one-quarter inch plank at least eight inches wide, all rafters to be notched on the plate and spiked.

Hip and valley rafters to be three by eight inches

Bridge the floor with two rows of double herring-bone cross bridging where indicated on drawings; said bridging to be two by four-inch stuff and carefully fitted and nailed to floor beams.

CORNICE.

Form cornice as shown on detail drawings, sheets 14 and 15, with gutter on wings of buildings and four three-inch patent expanding galvanized iron conductors where directed, with two-inch lead goose necks and quarter turn at foot of each; joints in gutter to be made tight with sheet lead.

ROOFING.

Carpenter shall frame and construct according to drawings and sections, and do all the framing required in gables and supply omissions if such there be in the detail drawing; cover the roof with hemlock boarding, planed one inch to an even thickness, and one thickness of fine tarred felt paper.

SHINGLES.

Where shown on elevations, shingle with good quality sixteen-inch sawed pine, laid four and one-half inches to the weather and put on with two galvanized iron nails to each shingle.

FLASHINGS.

Shingle in wide zinc—thirteen-inch—flashings in valleys, and warrant all tight for one year; flash about ridge with best Alderly terne plate, and in and about fillet around porch entry.

OUTSIDE FINISH.

Make the finish on outside ornamental work, front, gables, brackets, cresting finials, porch rail, &c., all of clear, seasoned pine, according to detail drawings.

WALLS.

Inclose the walls with hemlock boards, planed one side to an even thickness, and two thicknesses of good felt paper, breaking joint, and cover with sap extra pine novelty sidings and shingles as respectively shown in the elevations and detail drawings, four and one-half inches to the weather, all nailed with galvanized iron nails, each board nailed to every stud and each shingle fastened with two of said nails; diagonally laid weather-boarding to be rebated and beaded according to detail drawings.

CASINGS AND CORNER BOARDS.

Casings and corner boards one and one-quarter inch thick; the top of all casings to be rebated and the under side of window-sills ploughed to receive clap-boards or shingles.

OUTSIDE STEPS.

With seven-eighths-inch pine risers and one and one-quarter-inch Georgia pine heads, with rounded nosings on the upper face and square edged on the lower angle, and returned at the ends on the steps belonging to the north elevation of the building; all steps to be supported on two by twelve-inch strings twelve inches on centers, the outer strings, where exposed to view, to be planed, and the foot of the strings to abut on a four-inch by four-inch piece supported by two cedar or locust posts four feet in the ground; the said posts must be completely charred or thoroughly coated with tar before being placed in the ground.

INSIDE FLOORING.

Coal shed to have a single floor of planed two-inch plank. Other inside flooring to be double, under floor to be of one-inch planed hemlock second-quality boards, laid diagonally across joists; upper floor of thoroughly seasoned and kiln-dried first-quality seven-eighths-inch matched Georgia pine, not over four inches wide, laid in courses, breaking joint every course, thoroughly strained and well blind nailed to every beam; all to be well smoothed and scrubbed at the completion of the building. Put one thickness of best asbestos felt paper between upper and lower floor.

GROUNDS AND FURRING.

Put on grounds for three quarter-inch plastering; cross-fur the ceiling with one by two-inch strips, twelve inches on centers.

INSIDE FINISH.

The inside finish to be of first-quality pine, filled with Valentine's or Murphy's wood-filler and stained a light and yet dull cherry color, without varnishing. The flat surface of the window and door trim to receive a darker stain, but darker only in tone in order to accentuate the verticality of the two features.

SHEATHING.

Sheath the halls and wardrobe-rooms four feet high with five-eighth-inch matched and beaded vertical pine sheathing, not over four inches wide. Finish with capping shown in detail drawings.

Put on sheathing before upper floor is laid and allow one-half inch extra floor below.

DOORS.

All doors excepting outside doors, and windows to have five-eighth-inch by six-inch plain-centered architraves, the outer faces being distinctly marked by mouldings as shown in the detail drawings; said mouldings may be made in two ways, the general method is shown in sheet No. 11, and the better method in sheet 12.

All architraves to be neatly mitered. Outside doors to be trimmed as shown in details, to be eight inches wide, and inside doors to have trim six inches wide.

Outside doors to be five-paneled as per detail drawings, one and three-quarter inches thick, of best seasoned, clear pine, with finish as shown in drawings.

All other doors to be one and one half inches thick, five-paneled, with stop-chamfer finish, as shown on the sheet of details No. 11; all doors to have rebated and beaded floor frames of ash and hard-wood thresholds; all doors to be of the best stock and kiln-dried.

WINDOWS.

All windows to have boxed frames with pockets, hard-pine beads and pulley-styles, two-inch sills pitching one and one half inches, one and three-quarter inch clear pine sashes in lights as shown, all double hung with good pulleys with cap over top and galvanized iron face, with Samson's window cord and iron weights, accurately balanced.

Inside bead of pine put on with blued screws. Trim of windows to be as shown on detail sheet No. 12.

WARDROBE SCREENS AND FITTINGS.

Set up an open screen partition in the two halls so as to form wardrobes as shown in detail sheet No. 13. The hooks to be in rows eight inches apart in each row. To be strong and of japanned malleable iron and to be screwed to strips at least four inches wide, as shown.

COLD-AIR BOX.

Make cold-air boxes as directed and shown on vertical section, sheet No. 5.

Cut hole in floor for connection with stove as required by furnace-men, make a seat in the northwest corner of the school-room, eighteen inches high and of a width and length as indicated on plan, sheet No. 1. One of the ideas involved in the construction of said seat being the purpose of concealing the passage of the air-box through the floor and thus enabling the supply of fresh air for heating the building to be drawn from an elevation which is above the stratum of damp ground-air.

Make coal or wood bins as may be directed, in the coal or wood-room.

HARDWARE.

All doors to be hung with loose-joint acorn butts, outside doors four and one-half inches by four and one-half inches—three on each door—and inside doors four inches by four inches.

Front door to have horizontal rim-knob, three-tumblered locks, Corbin's No. 1676, Inside doors to have horizontal rim-knob four inches by six inches with slide bolt, Corbin's No. 0540, and the coal door to have a knob and lock. The sliding coal door for the purpose of receiving the fuel into the building is to be secured on the inside by means of a stout wrought-iron hook and staple.

ROOF TRUSS.

Provide iron bolts made of the best cold-drawn wrought iron according to the dimensions shown on the drawings, and also the cast-iron shoes and knees as shown on sheet 16 and all the fittings necessary for the roof trusses.

The windows are to be secured by bronzed iron sash fasts to cost $1.32 per doz. net.

Wardrobe doors to be hung with a spring hinge equal to the "Gem Spring Hinge," so as to swing both to the left and the right.

STAINING.

Shingles on sides to be stained with either Cabot's Creosote Stain or Dexter's Patent English Stain.

If Cabot's is used, select stain No. 309 for the lower vertical weather-boarding, then use stain No. 335 for the diagonal beaded weather-boarding, then finish off the remaining woodwork with stain No. 332.

No. 309 is a rich, deep, olive green, No. 335 is a reddish salmon but with equal depth of tone, and No. 332 is a close approach to the softened yellow that weathering gives to good yellow pine. The trim of the windows may be made effective by using No. 335. Sash may be finished with No. 309.

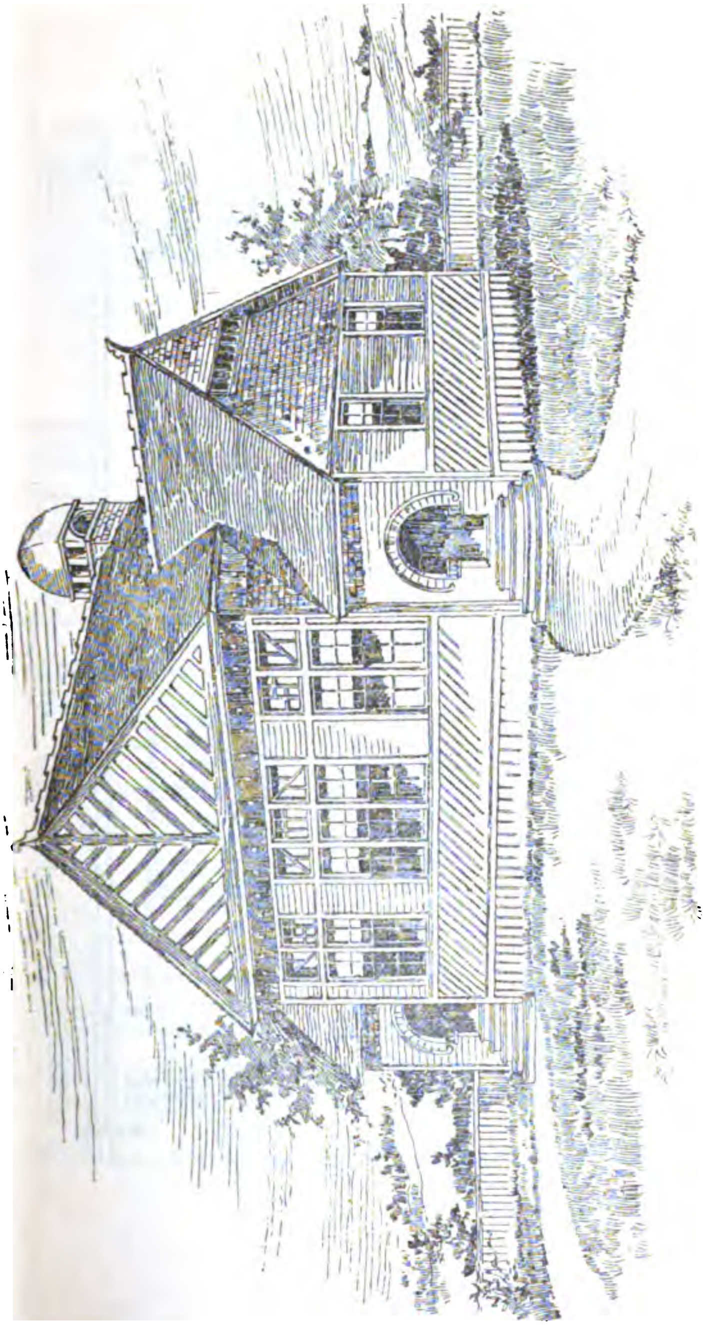
INSIDE WORK.

Fill doors and interior woodwork with patent filler, and finish with two coats of shellac well rubbed down with emery cloth and oil. Putty-stop after first coat and leave all in good order; oil with two coats school-room floor and outside steps.

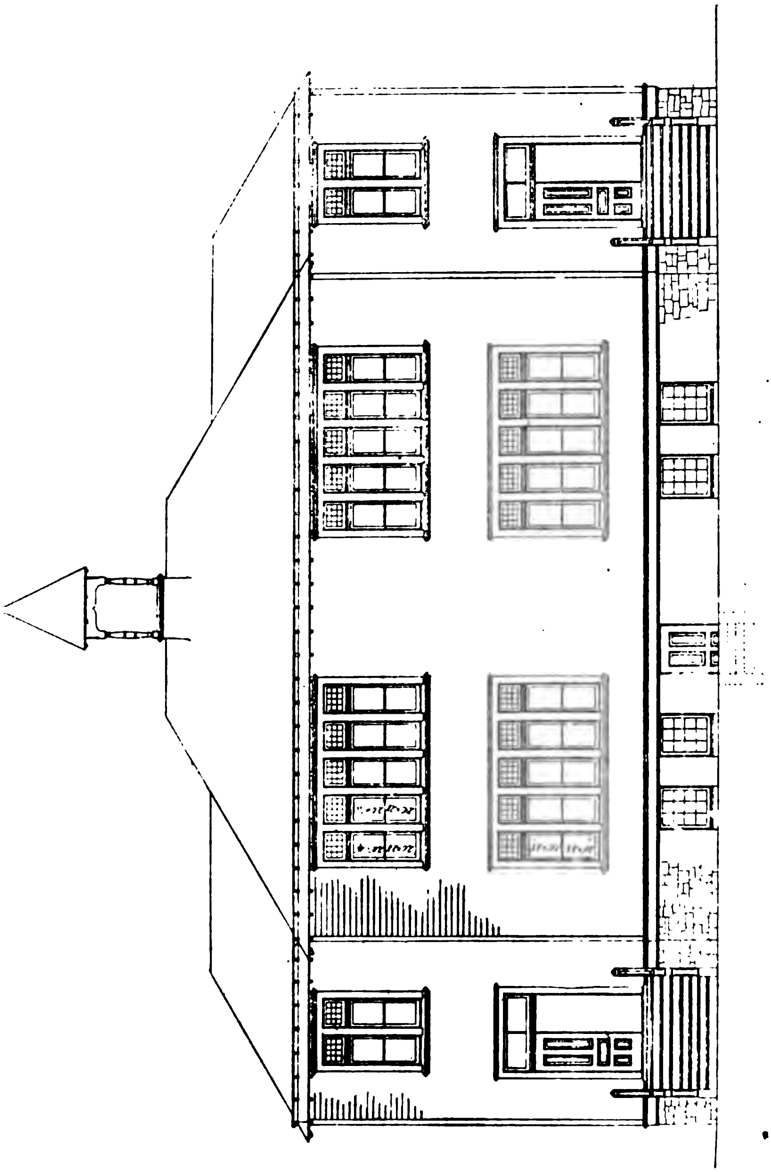
GLAZING.

Glaze in best manner in lights as shown, all outside sashes with first quality double-thick American glass, back tacked and back puttied, clean off at the completion of the building, and leave all work whole, complete, sound and finished.

The carpenter is to be responsible for the cleaning up of the building, to repair all accidental damage that may have occurred during the work of construction. He must take away all rubbish, have the flooring and wood work properly cleaned and leave the building in a habitable condition.

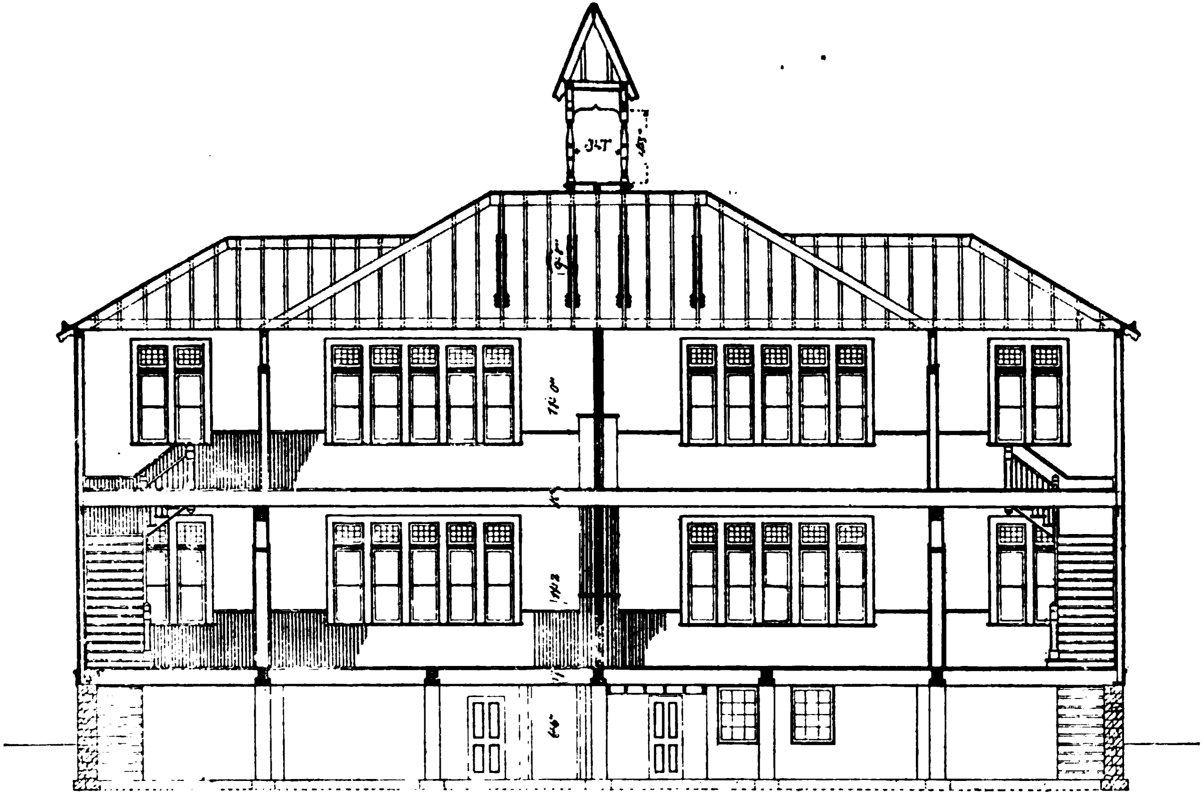


School House at Notch Road near Paterson, Passaic County, N. J.



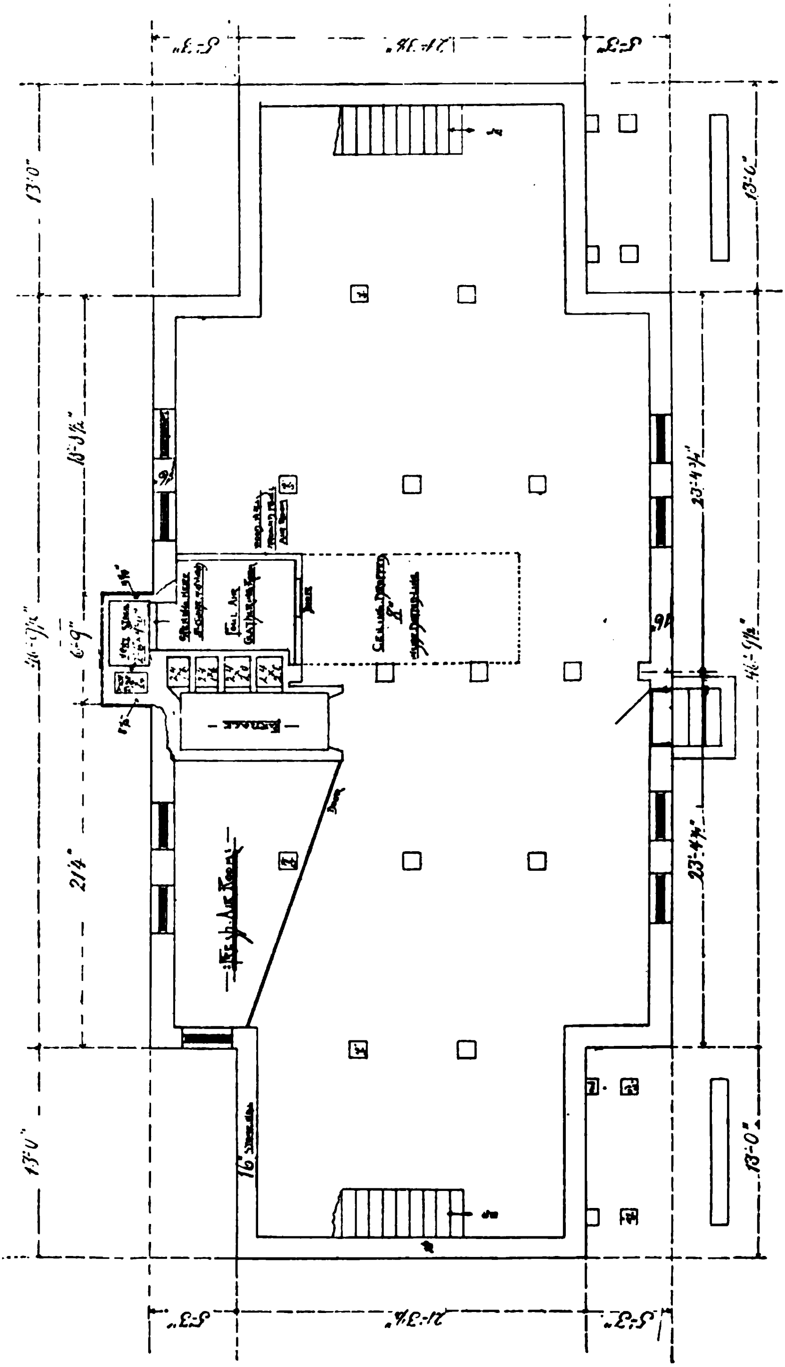
FRONT ELEVATION.

School House at Hopewell, Mercer County, N. J.



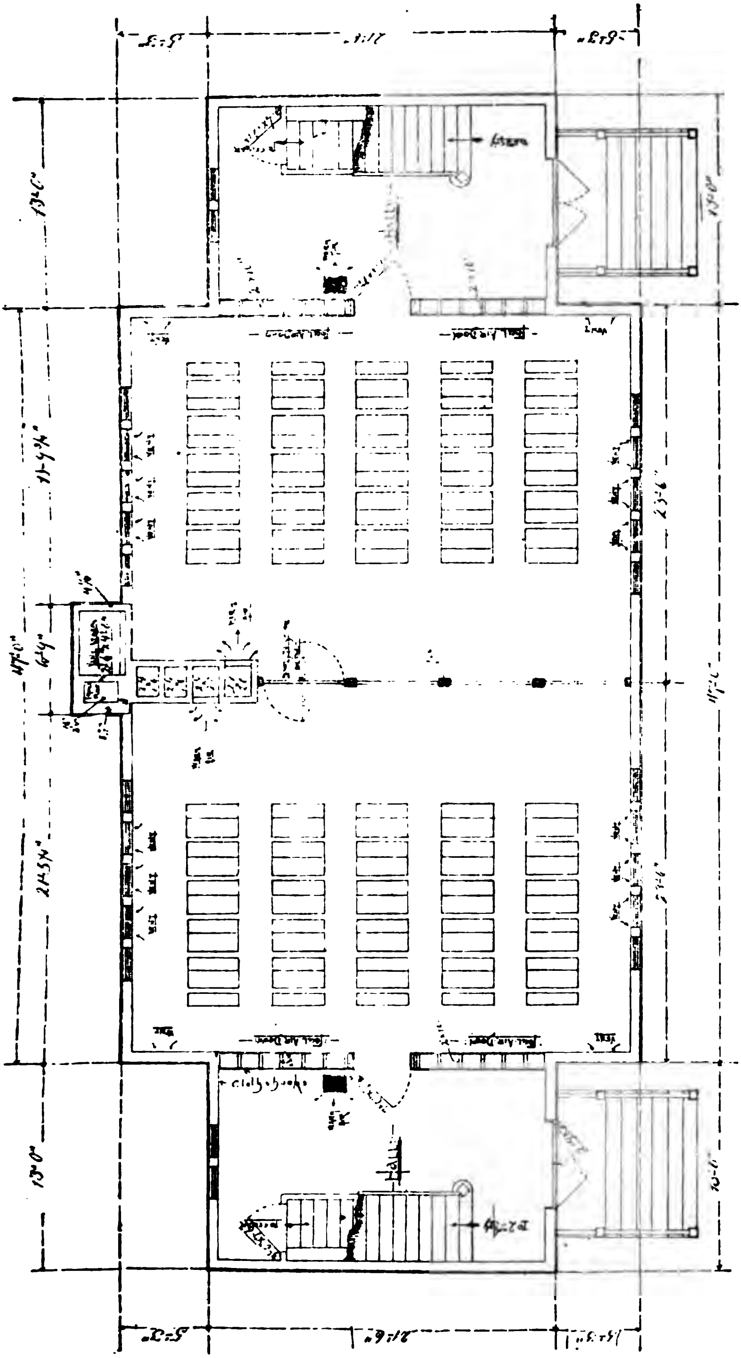
LONGITUDINAL SECTION.

School House at Hopewell, Mercer County, N. J.



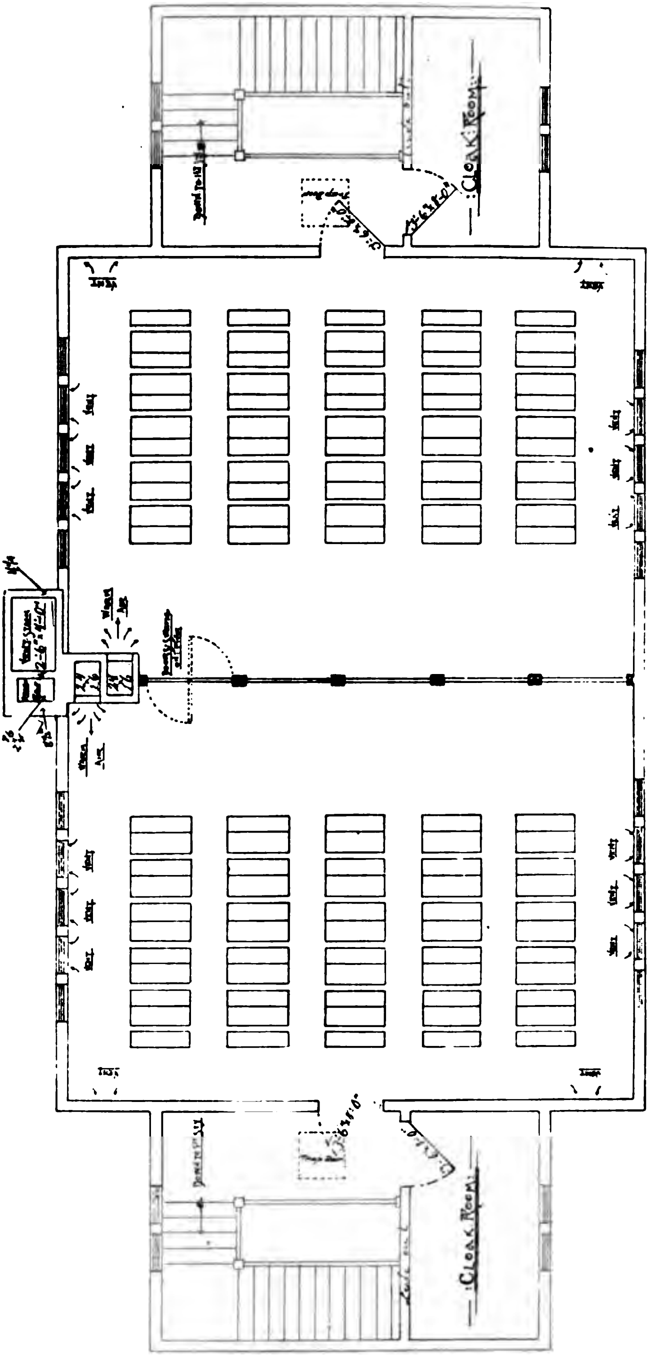
FOUNDATION PLAN.

School House at Hopewell, Mercer County, N. J.



FIRST FLOOR PLAN.

School House at Hopewell, Mercer County, N. J.



SECOND FLOOR PLAN.

School House at Hopewell, Mercer County, N. J.

I. The first is the one-story school-house at Notch Road, Passaic county, not far from Paterson. It furnishes a good example of a county one-room school-house, 24 by 33, of good size and appearance. The construction has been made with regard to sanitary requirements. It is taken from the designs of school-houses accepted by the Department of Public Instruction of the State of New York. For it we are indebted to Hon. Andrew S. Draper, State Superintendent of Schools, New York; also to Samuel Phillips, Esq., of Notch Road, Paterson, for valuable aid in procuring the accompanying illustrations and particulars. We give the perspective, not including various drawings, somewhat explanatory, to which reference can be had. The cost of the building was $3,000, of which $500 was mason-work.

II. Our next is the two-story school-house (four rooms) at Hopewell, of which we give (1) the detailed plans of the entire building, and (2) the front elevation and longitudinal section. We are indebted for this to the architect, W. A. Poland, of West State street, Trenton, N. J., and also to A. G. Fetter, Esq., of Hopewell, for various particulars. The cost of the building was as follows:

Contract work for material, carpenter and mason-work.........	$3,987 00
Extras..	207 52
Heating and ventilating..	502 67
Extra blackboards put in..	26 81
Land..	776 00
Whole cost..	$5,500 00

III. Our third presents facts as to the commodious school building recently erected at Hoboken, N. J.

The subjoined local press account will give some idea of its extent and its advanced sanitary arrangements:

"The school building is located on the northwest corner of Willow avenue and Eleventh street, and covers 96 x 200 feet, of which must be deducted two playgrounds, one 43 x 96 and one 31 x 55 feet, both finished with smooth concrete and well drained. The building proper covers, therefore, 13,367 square feet, with a frontage of 157 feet on Willow avenue and 96 feet on Eleventh street. It has the form of an E, and is three stories high above the basement.

"The main entrance for teachers and visitors is on Willow avenue, while the scholars enter through their respective playgrounds, from Eleventh street and from Willow avenue, into spacious, well-lighted and ventilated fireproof stair-halls, which extend from basement to dome, and are a feature of the building, showing at a glance strength, safety and ornament combined.

"We follow the children's entrance and first wend our way to the basement, which extends under the entire building. This contains two large play-rooms with concrete floors, large store-rooms, coal-rooms and the boiler and engine-rooms. Outside of the main building in the basement, as a distinct annex, are the toilet-rooms for boys and girls, lighted through large skylights and ventilated by separate flues in the main smokestack, running up its full height of 95 feet, so that no smell whatever can enter the class-rooms.

"The toilet-rooms are models of sanitary plumbing, being provided with the latest kind of sanitary cast-iron enameled closets, flushed continuously by automatic tanks.

"The basement also contains the entire heating apparatus for the building, which works somewhat like this: A large tubular boiler 5 x 6 feet supplies steam at low pressure to about forty-three special coils, which are distributed around the outside walls between the different windows; each coil is inclosed in a tin-lined box which receives air from outside, taken in under the windows; this air is warmed over the steam-coils and ascends through spacious flues to the different class-rooms, not into the faces of the occupants, but not less than five feet over the floor; the supply and temperature of the air can be regulated at pleasure.

"In the basement is also a separate boiler and engine which drive the fans for ventilating the class-rooms, &c. There are two ventilating fans, each five feet in diameter, placed in the floor of the tower, and the foul air is exhausted through separate flues from each class-room to the space under the roof as a common chamber, and then thrown or blown out into space through the large circular openings in the tower.

"Going up-stairs to the main floor we find ourselves in a wide and light corridor, which connects the two fire-proof stairs with the private entrance on Willow avenue. The private hall is separated from the public hall by a glass door. Handsome and easy stairs extend up to the attic for teachers' and visitors' use.

"Going back to the corridor we find, at the Eleventh street end, the Principal's office, and connected therewith rooms for supplies and library.

"Now comes the most important part of the building—its class-rooms—and as we enter one and another and still another, we are impressed by the light and airiness which is felt everywhere. We are assured that all the twenty-three class-rooms of the building are of uniform size, 23 x 33 feet, no room varying over a foot in any direction. The clear height of all the rooms is 14 feet, and the light and graceful metal ceilings and the grayish color of the walls give everywhere a pleasant rest for the eyes.

"Attached to each room is a large wardrobe with a large window to every one, strong clothes-hooks for fifty pupils, thus reducing the dangers of contamination by infected clothes to the smallest degree.

"The building contains, besides the twenty-three class-rooms, two large recitation-halls, each 48 x 60 feet, the upper one being clear of posts and eighteen feet high in the clear, well suited to public meetings, &c., and capable of holding 1,000 people, as was demonstrated at the public dedication.

"The general impression throughout is one of comfort. The light woodwork, finished in natural colors, is a great credit to the carpenters, and equally well shows off the masons' and plumbers' work. Water is supplied on every floor. The teachers have a cozy sitting-room on every floor, well supplied with lockers, tables and chairs, with suitable toilet-rooms convenient thereto.

"The signaling and call system for the entire building will be perfect, the remotest room being in communication with the Principal's office, also with the janitor in the basement; each floor contains, besides, a large fire-alarm gong, which instantly warns the entire school of impending danger, which we hope will never have to be faced by the children and teachers."

It is the intention of the architects (Beyer & McCann) and the Trustees to have tests made, from time to time, of the heating and ventilating apparatus. We refer, in this connection, to an article in our Eleventh Report, 1887, pages 57 to 68, for air-tests furnished of other school-buildings by Prof. A. R. Leeds and Engineer McCann.

All of these buildings are well worthy of the examination of districts or School Boards contemplating the erection of new school-houses.

Hon. E. O. Chapman, the State Superintendent, or our Inspectors, can point to many others which present valuable improvements.

The matters of heating and ventilation, of location of blackboards, seating at desks, and various other points, need the same expert attention and advice. All these have been carefully attended to in the school buildings and schools which we have specified.

We have thus sought carefully and directly to call the attention of all interested in education to the vast importance of this definite preparation for the physical care of all children attending school, and of the need of a thorough instruction in hygiene and physical culture. The soul and the mind have indeed paramount claims, but in this mortal life they cannot get on well without the body. They who slight the casket or leave it to the common risks of circumstance, endanger its contents. Let us have well-ordered attention to the welfare of the entire being, and in our school plans secure harmonious development of all the various parts, so that there shall be true symmetry in manhood and womanhood, and such results as come from a well-directed course and from the common ability and consent of all the powers to co-operate in securing their own profitable well-being and that of society at large.

THE AIR IN OUR SCHOOL-ROOMS.

BY PROF. SAMUEL LOCKWOOD, PH.D.

"The blood is the life." And how admirable the mechanism of the crimson fountain! For the distribution of the living stream a force-pump works steadily without stop. For the supply and purification two laboratories are busily engaged; the stomach in digesting the grosser food and the lungs in digesting the finer air. The gastric laboratory takes periods of rest, but the pulmonary activity never ceases, except with the dissolution of death. Food is taken upon the hint or prompting of hunger. But we breathe automatically in health—unconsciously, as upon instinct, even when asleep.

As to food, the greed for gain has begotten the science of adulteration. To some extent these practices are amenable to law. As to "the common air," virtually it has no legal restriction, however perilous it may become by vitiation. In kind, though not in degree, "The Black Hole of Calcutta" has its similar in some places devoted to worship and education, and notably the latter. For absolutely pure water the chemist dares not trust nature, but resorts to his aqua distillata. Nor is the outdoor air devoid of admixture from its terrene contact. Were it otherwise "the blue, ethereal sky" would be to sight simply colorless, invisible. So the pneumatologist can get pure air only by some laboratory process. But then the kindly ingenuity of nature has made provision in the efferent activity of the ciliated epithelia in the respiratory passages, a million tiny brooms dusting these air-chambers, all sweeping towards the outer doors.

Not all microbes are morbific. While some are the carriers of disease, others are functional in a sanitary sense. I apprehend that aqua distillata can never supersede the water from the spring. The one is dull, the other sparkles. So with the air. Space has its cosmic dust. It seems a need for the optic sense, and perhaps the health of the respiratory mechanisms. For if cilial activity should cease in the epithelia of the air-passages, what changes in the direction of atrophy might not befall the mucous walls of these chambers?

Hence we must not be hypercritical, even in this affair, of the air in our dwellings. Up to a certain measure we must meet the inevitable. For this the internal service is adequate. But let us not rest content when the million maids are unable to sweep out the chambers. It is with this condition of the school-room air that I have been dealing. And hoping to make a clear and plain statement I will sketch, as concisely as may be, the problem in hand, the methods pursued, and the results obtained:

I. We must first keep in mind that we are dealing with indoor air. Hence we should expect to find something plus, or besides that in the outer air.

Besides it is restricted air. A child should have from 300 to 400 square feet of gently active air, whereas in some of our schools the average per child of still or almost unchangeable air is but 112 cubic feet. This compared with that which he breathes when out of doors at play, is as wading in a puddle to bathing in the sea.

The adulterants or impurities of the school air are personal—the excreta of the respiratory passages, exfoliata of the cuticle; also debris from friction of the floor and the wearing of clothing. Hence, as to the cuticle and clothes, how important is the individual cleanliness. The above concerns the present or usual state; the unusual state is when the microbes of contagious or infectious disease are found.

The fourth factor in this search is the presence of carbon dioxide in the air.

The determination of the carbonic acid appears on the spot. For the rest, all the study of our finds must be done at home; and the most intricate is the microscopic or specific determination of each object in our finds. If six villains have burglarized my domicile the enumeration is itself important, but the matter carries far greater significance the moment I am able to designate them respectively by name. This may draw upon the high art and patience of the professional detective. It is fully as much so in the determination of the specific impurities in the air. It is a work of patience, and may tax one's best knowledge of vegetable and animal biology and of physiology, with the most skillful use of the microscope. But whatever may be the cost of work and patience we must know by name these morbific corrupters of the air breathed by our children.

II. In respect of my methods I have been, of necessity, for the most part a law unto myself. In testing for carbonic acid "Wolpert's Air Tester" is a device simple and efficient. I did not, however, follow Wolpert's instructions, as I found too much unutilized air when compressing the bulb. Instead of his 3, I used 4 cubic centimeters of lime-water, through which I forced 25 compressions of the bulb. As bulb and tube held not less than 53 cubic centimeters I allowed for residual and escaping air and called it 50 cubic centimeters. Hence I passed through the lime-water 1,250 cubic centimeters of air in each and every school-room tested. To be allowable, the black spot at the bottom of the tube ought not to be wholly obscured by the amount of carbonate of lime thus produced. I have tried the same in every way exactly in my study, which is warmed by heater, and have not even discolored the water.

Leaving the chemical test, the next is to get the floating impurity of the air. I here resorted to two methods, which I respectively called the wet and the dry. In the wet process permanganate of potash was used. One thousand cubic centimeters of air were washed by agitation in 20 cubic centimeters of distilled water. Into this were put a few drops of water-solution of the permanganate; oxidation would cause the impurities to settle.

For the dry method I had to devise an aspirator for myself. This for the qualitative response proved satisfactory, but I did not depend upon it for quantitative results. The exhaust chamber contained 100 cubic inches of space. As the aspirating valve was drawn twelve times, 1,200 cubic inches of air thus passed through after impinging in its passage upon four glass slides smeared with chemically-pure glycerine. To these little traps the impurities would adhere.

The reason for my using the two methods is simply this: By the wet process I got trustworthy quantitative results, but oxidation breaks down all organisms after some time, thus making the catch unsuitable for the microscope. Immediate mounting of the material in a preservative fluid will in part answer. But the tendency of the permanganate is to dissolve all organisms, whether animal or vegetable, whereas the catch, by the dry method, remains unaltered; hence, the best microscopic work can be done on the specimens thus caught.

Then came the need of material for comparison. Hence the necessity of mountings of the outer air-dust, and fibers of linen, cotton, and wool that have been worn, and even exfoliata of the skin, healthy and otherwise, the different scurfs, the starches that enter into the domestic use, &c., &c. Very much of this work, when done the best, proceeds by comparison from the known to the unknown.

III. As to the results obtained. These have exceeded my expectations. The carbon dioxide is abundant, I think the worse, where stoves are used, the difference being, I think, in favor of the furnace-heated air. In stove-heated air there is a double draft upon the oxygen—the consumption by fuel and by the lungs. I am unable, with the appliances at my command, to formulate upon my specimens these chemical activities in figures. It is easy, however, to see that, given a percentage of oxygen consumed when breathing pure air, an important factor is introdueed, when it is actually breathing air already in part eliminated of its oxygen. In this way we cannot say that so much carbon dioxide was generated from so much original air. With such data the power for injury is greatly intensified.

Here are several bottles; each one, less what I have taken out for examination by the microscope, contains, in 20 cubic centimeters of distilled water, the washing of 1,000 centimeters of air of a badly-ventilated school-room. The room should have afforded each child from 300 to 400 cubic feet of air. The actual provision varied from 112 to 125.

It would be somewhat startling to get at the actual weight of this impurity in a cubic foot of air, and thus approximate the possible amount taken by a child in the school hours of one day. The potency for evil, however, should, in my opinion, be charged more upon the smaller particles or organisms than on the larger.

But, on the evidence of the microscope, who or what are these loathsome intruders? Their name is legion for number, and they are of great variety. If I should make a picture of the impurities in the out-of-door air in winter, I would get mainly mineral dust, such as the air in movement laps up from the road, with some vegetable dust, in like manner derived from the woods and fields. All this, however, is generally innocuous. It is expelled from the respiratory system by the ciliated epithelia, as already stated. Such a drawing I would compare with this, representing a very small part of the catch in one school-room. I could then say, "Look on this picture and on that—Hyperion to a satyr." Here are particles of wood, the abrasion of the floor by restless feet. Here, too, is the mineral dirt from the rasping, or, if you will, the cleaning of dirty shoes. Here, too, are fibers—a few of linen, but quantities of cotton and not a few of wool. These are the friction or wear actually in process of the children's clothing. Curiously associated with the wear of cotton fabrics, starch grains are quite abundant. Here, then, is ocular evidence of the ease in which the child may be the carrier from home of communicants of morbific tendency. Take the starch-grains as one item among the innumerable. I was astonished at this frequency. But, if a starch-grain can sail so easily in quiet air, what is to hinder the morbific microbe in its insidious wandering, for, in comparison in size, the bacterium is to our starch-grain as a pistol-shot is to a cannon-ball?

But our story is not a quarter told. In great numbers here are the excreta of expectorated and coughed epithelia from the mouth and respiratory passages. Here, too, with fragments of hair, are dandruff scales and skin-scurf, with what is known as pavement epithelia. Nor is there wanting even the white, semi-corneous scales of exanthematous cuticle, with occasionally a little scale containing at its center a bright crimson spot. The child, to allay the itching, has scratched so deeply as to reach a capillary. But, though telling what the eye has seen, let us halt, lest the narrative, though interesting, react from its unpleasantness.

It surely must be that inured to these conditions the child to some extent becomes an immune. But it must also be certain that with so much evil seed implanted there are inevitable consequences, evil fruit in a painful manhood or womanhood. How plainly appears the distressing fact that the cleanly child must inhale the exfoliata of the unclean and even diseased.

I was a little perplexed by an unexpected difference in the result of the testing of two adjoining rooms in a graded school. One contained eighty little tots in their second year's schooling. The other had about fifty-five, but these were three years in advance of the others. In size and situation the two rooms were alike. Except as to the carbon dioxide, the room of the tots showed much the purer air. That of the advanced room contained a decidedly larger amount of impurity, such as exfoliata, dandruff, scurf and waste of clothing. It occurred to me that an advance of three years in age warranted more animal spirit, more activity, more lung-work. Then came in the consideration of very recent physiological research or the varying make-up of tissue at different ages.

I feel that the above can only be presented as tentative. I shall hope to resume this work, with perhaps improved methods—in a word, with the light of experience.

Some work on the external air gave me some facility. But the air in an unventilated school-room presents a problem of a more complex nature. Although microscopic fungi were found, I made no special hunt for microbes. These disease germs must and will be disseminated by the subject of its special malady.

But all this apart, have I not shown how fearfully the hygiene of the air is overlooked and violated, and how imminent and disastrous are the possibilities of contagion, should the germs get sown upon a soil made so fertile by long morbific saturation? In childhood is an elastic resistance which is wanting in adult age. Hence it occurs too often that the teacher succumbs to the unhealthiness of the situation.

FREEHOLD, N. J.

METHODS AND RESULTS OF PHYSICAL TRAINING.

BY PROF. CHARLES H. RAYMOND.

When, through the Secretary of the State Board of Health, I was asked to prepare a paper for the Association this year, he was careful to explain just what he wanted, viz., "A technical outline of the physical instruction and training at Lawrenceville. What is required? What is taught? What exercises are compulsory? How much time each day or week is assigned to these? How much regard is had to the needs of the individual? In other words, we desire to show a course of teaching and training just as definite and just as really a required curriculum as in any other department of education." In what follows, I shall try to satisfy this desire and present a view of work actually done in physical culture in the Lawrenceville School. The nature of the demand must be an excuse for what might otherwise seem a too frequent reference to the school question.

Before passing judgment upon any course of instruction, the intelligent critic asks, first, something about the pupil himself, then what it is intended to do for him—how the work is done—and finally, what are the results.

With these four questions answered, practically all the data are in a form from which one may get a fair estimate of the value of the work. I will, therefore, take up in their order the critic's questions, and first say a word about the boy.

The Lawrenceville boy numbers at the present time about 225. He ranks, generally, in age, and always in ability, according to his form, the Fourth Form representing the senior grade of excellence. His physical status may be partly determined by a reference to the following statistics. As to age, the following brief table will explain:

First Form—Average age of 56 members, $14\frac{44}{56}$, or about $14\frac{7}{9}$.
Second Form “ “ 58 “ $16\frac{5}{58}$, “ 16.
Third Form “ “ 28 “ $17\frac{5}{28}$, “ $17\frac{1}{6}$.
Fourth Form “ “ 27 “ $17\frac{6}{27}$, “ $17\frac{1}{5}$.
Average age, about 16¼.

As to extremes, another table compiled from the first measurements, taken last December, may be interesting, and will also serve to show what measurements are taken:

Oldest boy in school	20 yrs.	Youngest	12 yrs.
Tallest	6 ft. 1⅝ in.	Shortest	4 ft. 5½ in.
Heaviest	184 lbs.	Lightest	62 lbs.
Longest arm stretch	6 ft. 3 in.	Shortest	4 ft. 6½ in.
Greatest breadth of shoulder	17¾	Smallest	11½
“ “ “ waist	11	“	7
“ “ “ hips	13½	“	8½
“ girth, neck	14¾	“	10¾
“ “ right arm, uncontracted	13	“	6¾
“ “ “ contracted	13⅞	“	7¼
“ “ left arm, uncontracted	12¾	“	6½
“ “ “ contracted	13½		
“ “ right forearm	11¾	“	7⅝
“ “ left forearm	11½		
“ “ waist	35¼	“	22½
“ “ right thigh	26	“	14
“ “ left thigh	26		
“ “ right calf	16	“	10
“ “ left calf	16½		
“ vital capacity	320 cu. in.	“	110
“ number pulls-up	16		
“ “ dips	14		
“ inspiration	40½ in.	“	23
“ expiration	35	“	24¾

To these I might add other statistics (not that they would really describe the boy, yet they might perhaps better classify him with reference to the more manifest facts that bear upon his physical training).

But, while the measuring-rod and tape may seem more especially fitted to indicate body and muscular conditions and development, it ought always to be kept in mind that there are present, wherever the boy is, certain other factors, which cannot be thus measured, and yet are frequently forgotten or ignored when answering the question, “What of the boy?” No physical statistics describe, or ever can describe, all the traits which touch upon, modify, and often embarrass a boy's physical training. We may theoretically divest him of part, or most, of the robe which covers his three-fold nature, and view him solely as an animal, a creature of purely physical dimensions, a being of bone, muscle, nerves, if you please, respiration, circulation, digestion, growth. Wise or otherwise, we may do this theoretically, I say, but practically, never. The boy that enters the gymnasium brings more than a body to the master. He brings a complex organization, made up, not of flesh and blood alone, but of appetites, passions, will and intellect—or lack of them—personal peculiarities, eccentricities, inexperience, heredity. He must be treated accordingly, and the personality of the boy modifies the method of his training. How much, we can hardly stop to indicate. It is enough, perhaps, if we let this thought run on between the lines as we proceed. We have thus negatively, and very imperfectly, described the boy. Now, what do we purpose to do with him? "Make him healthy, and keep him so," I hear you say. True, the first object of all sensible physical culture is health, but as by getting money we may also get added comforts, pleasures, &c., so in obtaining health we may also obtain other things.

Strength, growth, grace are not incompatible with this main object. In fact they are in some degree inseparable from it. The same may less certainly be said of discipline, dexterity, confidence, character. Nay, more, one questions if the ideal system and, in some degree, every system of physical culture will not sometime insist that these last-named qualities are the natural products or results of all right health training; that the same process which bestowed this latter boon will, of necessity, produce strength, give growth, grace and dexterity, impart confidence and strength of character, and all this through the agency of a discipline of body acting in harmony with a discipline of mind.

The primary object, however, of the work done in physical culture in the Lawrenceville School may be simply stated as follows: To give health, development and strength to something like 225 American boys, of ages ranging from 12 to 20, with the associated idea that these terms suggest but a fraction of all that is really implied in them, and, too, that these things physical are sought for as a means of imparting and sustaining a higher, an intellectual, health, development and strength. What facilities are offered for this? What is done for the boy? In the first place, during the fall and spring plenty of outdoor room is given him for exercise, while during the rainy winter months he has access to a small gymnasium. In the next place, a definite period of time is set apart when he is required to exercise. Finally, an endeaver is made to grade the play and gymnastics according to the age and strength of the pupil.

To go more into details (for generalities always fail to give exact ideas), a boy coming to Lawrenceville in the fall term will find his work assumes something like this form: From 8 to 12:15, with a brief intermission, study and recreation; from 2 to 4 P. M., the same. But at 4 P. M. (Wednesday and Saturday half-holidays excepted), he meets a new requirement, that of play. At the ringing of the bell, clad in his foot-ball, or tennis suit, he goes out upon the campus, and from that time until 5:30, he plays; he must play. There is absolutely no school requirement but his bath that takes precedence of play. This goes on day after day, from September to December, and from April until June. In the spring, of course, the games are not limited to foot-ball and tennis. There is a wider range of choice between base-ball, lacrosse, tennis, bicycling, and training for field-day sports. Two things ought to be noted in connection with all this play. One is, that while it is play, it is earnest play, and, so far as possible, what may be called intelligent play. The other is, that one of the masters on the athletic board is a school physician. So much for the outdoor exercise, which constitutes two-thirds of the recreation-time of the entire school year. We now turn to the other, third, the inside gymnastics, which begins with December and lasts until April. The present gymnasium is very small, and, of course, the problem here is to do the most work we can (for the health, development and strength of the boy, to get the best practical results possible) under the existing circumstances. The plan of work is something as follows: In the first place, before the gymnastic work properly begins, the boys are registered—that is, they fill out the following blank:

REGISTRY.

....189

Student fills out all but first blank.

No.....................

Age.........................

Last Birthday..

Where Born..

Occupation of Father..

Father Died of..

Mother Died of...

Have had or am subject to the following diseases:

[Student will put cross after those he has had and underline those he is subject to.]

1. Asthma.
2. Bronchitis.
3. Constipation.
4. Colds.
5. Dizziness.
6. Dyspepsia.
7. Dysentery.
8. Diphtheria.
9. Enlarged Veins.
10. Headace, Nervous.
11. Indigestion.
12. Biliousness.
13. Neuralgia.
14. Pleurisy.
15. Piles.
16. Pneumonia.
17. Palpitation of Heart.
18. Rheumatism.
19. Scarlet Fever.
20. Shortness of Breath.
21. Side ache.
22.
23.
24.

SPECIAL REMARKS.

Next, the most important measurements bearing upon the physical developments are taken. Finally, tests are made of their lung capacity, heart action and strength.

From the showing of these three tests the boy's class and individual work is, in a general way, determined. In most cases none of these tests affect the boy's relation to his class-work, but in the individual's work they are the great factor. They determine many important things—how much work the boy ought to do, what kind, and what he ought to avoid. They also often exclude him absolutely from some of the more showy but exhausting work. Just here very frequently the work for the individual may need to step over the line of the merely recreative or developing gymnastics and approach the curative.

Along with measurements comes class organization. During the coming year the school will probably be divided into six graded divisions, each division exercising four periods a week. These periods vary from three-quarters to an hour in length of time, and are supplemented by an open gymnasium on Wednesday and Saturday afternoons. The registering, measuring and organizing begin soon after Thanksgiving. At this time from one to four leaders or captains for each division are chosen and started into their work. These captains are old students who, if not already initiated, have been working for the place during the past year. These now meet by themselves and are instructed in the formalities of roll-call, class formation, marching, order, &c., tested in old exercises or initiated into new, and finally taught the meaning of the different exercises and the value of graduation in work, economy of strength, and importance of good form. Books on drill, training and physiology are placed at their disposal, and thus when, after Christmas vacation, work really begins, it starts off thoroughly organized and self-directed. What is that work?

There are three grades of class-work: The Roberts system of dumb-bell drill for the Fourth and stronger Third Formers; competitive dumb-bell drill to music for the two rival divisions of the Third and Second Formers, and free gymnastics, poise-work and marching for the First Form. To these grades of class-work, exercises must be added—

For the first year, light work in wands, clubs and mat-tumbling.
For the second year, clubs, low bar and recreative work on horse.
For the third year, parallel and horizontal-bar work, chest-weights and horse.
For the fourth year, ditto, but more advanced.

This fills out the schedule of graded class-work, and is, in the main, carried out, not satisfactorily always, by any means, but actually.

But in the face of all this class-work, what becomes of the individual? Isn't he completely crowded out? Yes and no.

Of course the issue is, which must predominate, class or individual work? Our divisions now can tell the former, and this, done as it is, promptly and earnestly, does not occupy more than from fifteen to thirty-five minutes of the period. The rest of the time, plus the half-holiday afternoons, is entirely at the boy's disposal, and the record of his measurements and the comparison of them with other measurements, especially with the printed tables showing what ought probably to be the proportions of a boy of his own height and weight; these things, coupled with the secret sense of shame which the ordinary boy entertains for his weak points, tend to stimulate a very large number of boys to improve their spare moments in sensible, enjoyable body-building.

For advice and help, when needed, he goes to his captain or instructor. It does not take long to find out what will help a small left arm, a weak chest or an elevated left shoulder. All such individual work, though, is of necessity optional.

Of the details of work done in the different divisions there is little time to speak. The Roberts system, used in the upper forms, is too well known to demand description here. To the uninitiated it may seem rather severe and drastic. A more intimate acquaintance with it may prove first impressions to be rather erroneous. It surely reaches the circulatory apparatus and evokes perspiration as well as respiration. Like all other exercises it needs to be well done to be really efficient. I was particularly interested to note how three months of it affected two very different boys in the Fourth Form of last year. One was a fine-built, rugged fellow of eighteen, the other a weakly, consumptive-looking scholar a year younger. The result is as follows:

Age.	Height.	Weight.	Arm Stretch.	Shoulders.	Waist.	Hips.	Neck.	Upper Right Arm, uncontracted.	Upper Right Arm, contracted.	Upper Left Arm, uncontracted.	Upper Left Arm, contracted.
17 17	5.9⅛ 5.9½	108½ 113	5.9¼ 5.9⅞	13¼ 15	9 8½	12 12	12¾ 13⅛	8 8¼	9¼ 9½	7¾ 8⅛	9 9½
—	⅜	4½	⅝	1¾	—½	0	⅜	¼	¼	⅜	½
18 18	5.6⅜ 5.6¾	118½ 132½	5.7⅛ 5.7	14 15	8½ 8½	12 12½	13 13½	10¼ 11¼	11¼ 12½	10⅛ 11¼	11 12⅜
—	⅜	14	—⅛	1	0	½	½	1	1¼	1⅛	1⅜

Age.	Right Forearm.	Left Forearm.	Waist.	Right Thigh.	Left Thigh.	Right Calf.	Left Calf.	Pull-Up.	Straight Dip.	Vital Capacity.	Chest Inspiration.	Chest Expiration.	Heart.	Lungs.
17 17	9 9⅛	8½ 8¾	24½ 25	18 18	17½ 18	12½ 12¾	12½ 12½	2 4	0 0	227 230	31½ 32	28⅝ 30	....	....
—	⅛	¼	½	0	½	¼	0	2	0	3	½	1⅜	......	......
18 18	9¼ 10⅜	9⅜ 10¼	25½ 26½	19 21	19 20½	12½ 13½	12½ 13⅜	10 11	4 9	195 200	32¾ 34	30¼ 31	N. N.	N. N.
—	1⅛	⅞	1	2	1½	1	+⅞	1	5	5	1¼	¼	......	......

The competitive class-work done in our Third and Second Forms to music may meet a protest from some who believe not in competition or the "harmony of sweet sounds," in connection with gymnastic training. Music may stimulate to cause subsequent reaction. Competition may over-exercise head as well as body, but I find both well adapted and seemingly producing good results in our large classes and small gymnasiums. I have found the same fact true in young ladies' classes. Professor Hitchcock's statistics show them to be equally well adapted to the college gymnasium. The movements are so arranged as to bring into play all the principal muscles of the body, giving frequent rests to the different groups. The music inspires the work and trains the ear as well as the arm and foot to time and accuracy, while emulation but helps to greater attention to the very important details. The figures in the comparatively few measurements taken at Lawrenceville seem to indicate gains here about equal to those obtained from the Roberts system.

Of the value to the fairly developed boy of light, systematic, graded work upon the parellel and horizontal bars and horse, a very great deal could be said. For growth, strength, confidence and control nothing equals them. All deforming tendencies can be easily counteracted by the chest weights, while the German system, which develops, with the utmost accuracy and exactness, the greater exercise out of the less, is in itself a stimulus to method and system in upbuilding the mind as well as the body. Graduated exercises on the bars done in good form with a judicious intermingling of chest-weight and horse-work, will afford the ordinary boy as much rest of mind, as much enjoyment and as much real exercise as anything I know of in the gymnasium.

I notice that my paper is headed "Methods and Results of Physical Training." I have hardly kept to the first half of my text, and I fear that I shall invite unlimited criticism upon the last. The work in gymnastics at Lawrenceville has been going on hardly long enough to give results there, and while I might have gathered statistics from work done elsewhere, I have not found the time to do so. But I do wish to say a word about the methods which seem to be necessary in obtaining results. The fact is that the deductions from body measurements need, generally, pretty exhaustive explanation to make them valuable. The registry form tells a straight story, so do the vital and strength statistics, but the measurements sometimes appear to defeat their own ends. They are so sensitive to conditions. The time of day affects heights and weights. If one knows the trick of it he can make a great development of the biceps in a day's time, consequently muscular work immediately before the tape is used makes sad contradictions in girths. The tape itself often does very unreliable work. Then there are individual factors which must have consideration. A man's weight ought not of necessity increase during a three months' course of training. The minus quantity is really a plus sign to the over-fat man, but when you add his record to other men's record, his losses to their gains, your result don't really mean much. And so different boys bring different natures, different dispositions and I might almost say different tissues to the work that bear upon the mathematical results, and yet are just the things that cannot be satisfactorily recognized by cold figures and calculations. Then, too, it is very hard to tell definitely just how much of your gain is to be attributed to natural development and how much to your training. Twenty of our last year's boys made an average gain of nearly an inch in height during their three months' work. Was any or part of it due to their gymnastics? If so, what part. So with their weight, their arms, their chests. (Until our anthropometry is far more comprehensive than now, we must not boast too much of our gains or deplore too seriously our losses.)

Mind, I am not depreciating the value of measurements and physical examinations. Conditions may be such as to compel a wise economy, even the exclusion of measurement, but of vital statistics, never. (These latter are vital to the teacher, vital to the parent and intensely vital to the boy himself.)

Nor, after all, are our measurements much less important. With all their uncertainties they are the only way for testing the value of a system of gymnastics as to its effects upon growth and development, and they alone will lead us to the perfect physical pattern of manhood and womanhood. But they have a far more practical value even than this. They are a stimulus to the boy. They give him some basis to stand upon. When a boy reads his record and finds that he is actually eighteen years old and weighs exactly 145 pounds, that his arms and legs measure just so much, that he can exhale 250 cubic inches of air, he begins to know where he is, so to speak. More than that, he becomes interested in himself. He begins to compare himself with somebody else—with his neighbor. He isn't satisfied then; he questions which is the better physical man of the two. This leads him to seek out the best standard. Then, when he has found it, the work begins. The right work, mind you. The work, not of prodigally making the strong parts stronger, but of economically making the weak parts stronger. And by this process he has done what? Why, a very great thing. He has got a right start in physical training. He has discovered not merely that he wants something, but he has found out what he wants. And when a boy has found that out he can get it; as Besant said, "His is the power and nobody can prevent him." But the secret lies in finding out his want.

The first of the four questions that I started out to answer is, What of the pupil? I hope what I have said will lead you to picture him as a young, healthy boy, fitting himself (at Lawrenceville) for college and the responsibility of after business or professional life. My answer to the question what it is intended to do for him, has been primarily to maintain his health, assist his development and supply him with a surplus, if you please, of physical strength. I hope, however, that what I have said has not given the impression that our endeavors are limited to those three lines alone, as certain words like interest, discipline, dexterity, confidence, character, dropped here and there, ought to hint at something more.

To describe in detail the work done has been impossible, but the general outlines have been generally laid before you. With the exception of the allusions to the so-called Roberts drill and German bar and horse-work, I have had no time to refer to any systems of training, some of which, especially the Swedish system, ought to have a decided hearing. I surely do not mean by my silence to imply any lack of indebtedness to many systems and many men and women. In so far as it is possible, it ought to be the endeavor of every instructor to test each and all systems.

The question of their use, however, in part or in totality, must depend greatly upon the conditions under which the teacher is placed. A thousand practical hindrances or opportunities weigh the balances here, and determine both kind and amount of work done, and all our criticisms must refer to this fact. The only true method in our present tentative attitude toward all exercise must be to prove all things and hold fast to the best.

I regret that, instead of indicating the gains and losses, the results of the work outside and in the gymnasium, I have felt obliged to limit my remarks almost entirely to the methods of obtaining them. But while our records, brief as they are, tell some very pleasant things about strong lungs gained upon the foot-ball and lacrosse field—the best place in the world in which to get them—and big arms and sound bodies developed within doors, there are many things which they do not, cannot tell, which are, nevertheless, just as really there as is the added inch that shows itself in the biceps or forearm.

I shall, therefore, close by saying that our registry list, books of statistics, together with the health record of our school physician, are always accessible, and if these do not suffice, we shall then endeavor to dispel all your doubts of the beneficial effects of plenty of outdoor and indoor exercise by introducing you to the Lawrenceville boy himself.

NOTES ON MENTAL HYGIENE.

BY PROF. J. MADISON WATSON AND PROF. A. B. POLAND.

Our Association at its annual meetings, for the past decade, has had papers and discussions on hygiene—mainly relating to physical activities and bodily health.

It is high time that we differentiate the subject and consider its mental aspect. Mental hygiene inevitably involves heredity, environment, and corporeal and spiritual conditions.

It is a great subject, requiring careful and extensive observation, personal experience and scientific study. I shall name simply a few suggestive points.

First. What is the mind of infancy; an absolute blank, a sheet of mere white paper, or a sheet whose every fiber bears the invisible hieroglyphics of heredity? If, in the mind of childhood, the mental and spiritual elements of many progenitors—elements of strength and weakness, of vice and virtue—lie, like words written with sympathetic ink, unseen until the contact of a reagent makes them visible, how important the use of right reagents, or influences, to develop noble lives.

Hence the essentiality of innocent social pleasures, amusements and recreations, of right educational materials and natural methods of teaching. Also, it is evident that normal mentality requires a wise selection in marriage; and that the State, by legal enactment, should restrict or wholly prohibit the marriage of imbeciles, and the vicious and criminal classes.

Secondly. Recognizing the fact that a healthy mind can be preserved in a healthy body only, we should study pupils in two ways; by mental tests and physical inspection, with a view to their classification, and the regulation and limitation of their mental work, both in and out of school.

Thirdly. Education, to secure mental healthfulness, must be largely individual. The foundation must be laid at home, and the essential education must come from the student.

There is no sovereign mode, no universal method.

The undue cultivation of human muscle, the fierce struggle to win prizes in examinations and mental contests, and the subordination of moral and religious instruction, are alike thoroughly abnormal and vicious. Length of life and prolonged happiness depend on the continuous cultivation of the physical, the mental and the religious existence.

NOTES BY PROF. A. B. POLAND.

Although we use the terms mind and mental, with something of definiteness, yet we should be troubled quite a little to state precisely what we mean thereby. The ancient conception of mind or soul as something distinct from the body, but temporarily residing therein, and hence affected by its physical environment, has largely given way to the more modern conception of mind as a something (entity, if you please) wholly dependent, so far as we may know it, at least, upon the cerebral portion of the nervous system. The mind seems to be a functional activity of the brain. But whether we regard it as a distinct and potentially independent entity, or as the mere sum or aggregate of physical reactions, is inconsequential so far as concerns practical hygienic rules for its growth, development and conservation.

Starting, therefore, with the assumption that the phenomena of mind, if not identical with nervous processes, are so thoroughly involved as to be inseparable therefrom, we may safely affirm that the mind is affected for health or otherwise by the condition of the general nervous system, especially of the sympathetic system; that the sympathetic system, in turn, is so dependent, both in a causative and resultant way, upon the digestive and circulatory systems, &c., that they cannot be divorced. Hence, all hygienic rules that result favorably on the digestive or circulatory systems will also, through the sympathetic system, affect favorably mental action.

It would be manifestly inappropriate and unnecessary to repeat the many well-established rules for the preservation of physical health, especially those that appertain to eating, drinking, exercise, rest, sleep, &c.

The careful observance of all these is absolutely essential to a mind of normal health and activity.

But in this discussion the question first arises, "What constitutes mental health?" Is it normal activity, tone, efficiency, equilibrium, or what? Or is it, negatively stated, the condition marked by the absence of any factors or qualities tending to deteriorate or lessen efficiency?

If mind and brain were identical, then a healthy mind like a healthy brain would be one whose functional powers were intact. Here we have to distinguish between the strong mind and the healthy mind. We can conceive of the arm as being perfectly healthy while far from being strong. As, for instance, the arm of the laborer as compared with the arm of the man of leisure. There may be various degrees of strength, varying from that of a Hercules to that of a child.

The healthy arm is one in which the functional processes are intact and capable of normal development though undeveloped. I suppose, therefore, that the healthy mind is one on which there is a harmonious balance of powers and capacities.

The term healthy is the logical opposite, too, of diseased, and we may be helped to a conception of its meaning by considering the marks of a diseased mind.

A diseased mind is one in which the normal is varied from in the direction of a lowered potentiality.

Or, considering disease as an active agent, the diseased mind is one tending actively towards further deterioration.

It is necessary to have a clear conception of the terms involved or there is liability to confusion in discussion.

A weak memory or deficient imagination may be due either to lack of use or to some pathological condition.

If we are to regard, therefore, both a weak memory and a diseased memory as evidence of an unhealthy mind, the hygienic rules to be adduced will not be the same.

So, lack of balance or harmony of physical powers may be due either to disease or disuse, to pathological or non-pathological conditions, and the discussion of means to restore the balance of power might, by the necessity of our definition, fall outside of the category of hygienic rules.

1. *Moderation and Regularity of Use.*

Limiting the field of discussion to those rules which may be considered as more purely mental, I would first emphasize the need of moderation and regularity in the exercise of mental powers. It is a well-known fact that the great majority of mankind use their minds with greatly varying degrees of moderation or excess. Now, we all know what the effect is upon the body of spasmodic or excessive use.

One unused to hard labor goes into the field to mow or pitch hay, or hold the plough. The result is physical exhaustion, an undue strain upon the nervous system, followed, it may be, by temporary prostration.

Now no one is so ill informed as to the injurious effects of such practice as to doubt for an instant its unwisdom.

But what do we observe quite commonly as a mental phenomenon; namely, a man unused to hard mental labor making some protracted and exhausting mental effort, the working up of a brief, the preparation of a sermon, the intense and prolonged application to some business project, resulting in the great consumption and loss of nervous force, followed, as in the case of muscular excess, by nervous prostration more or less complete.

Nothing is clearer than that the oarsman in training for the race, or the pugilist for the ring, must exercise moderately and regularly—not spasmodically and to excess, but with a due regard to the plain hygienic principle that force its accumulated and tissue hardened by slow and regular processes.

Hence, I would lay down this hygienic rule for the maintenance of mental health—that there should be regular systematic exercise of mental function. Just as certainly as muscular vigor and strength cannot be attained by intermittent exercise in the gymnasium, so mental health cannot be conserved by occasional and spasmodic exercise.

There is no more common and reprehensible practice in the schools than that of injudicious lesson-giving. The teacher for a day or week, it may be, works her class leisurely, until she takes it into her head to "make a spurt," as the oarsman would say, when she ruthlessly, and innocently too, makes demands upon her class that if attained must be attained only by an excess of effort that will leave the children in a greater or less degree of resultant weakness or prostration. All this is wrong. It arises in practice from the fact that the analogy between the conditions of mental and physical hygiene are not clearly apprehended.

Regularity and moderation in mental exercise are absolutely imperative to mental health.

2. Variety of Mental Occupation.

Still another rule of mental hygiene may be derived from a comparison of physical and mental phenomena.

Just as a change of diet and of atmosphere is often desirable, so variety of mental employment is conducive to mental health.

The best physical results are often obtained not by complete cessation from work, but by a change of occupation or environment.

The practice, so prevalent nowadays, of going into the country or to the sea-shore during the summer-time, is a good one. True, the social exactions are often greater than at home, but the change conduces to recuperation of waning physical powers.

The physiologist has proved beyond a doubt that certain mental operations employ their particular groups of nerves and brain centers. These nerve groups and brain tracts by constant and exacting use become fatigued, and a change of mental occupation, such, for instance, as from mathematics to fiction, becomes imperative. The flow of blood is diverted to different brain areas and new and fresh groups of nerves are brought into play. The particular effect is that of giving temporary rest to one set of factors, but the process is quite different in its mode and effect from complete cessation of brain or mental exercise. The difference is quite analogous to that of resting one arm by using the other. An equilibrium of conditions is established that is more healthful than using one set of muscles to excess and a corresponding set none at all.

The school-room application of this rule is had in diversity of studies. The change from the arithmetic to the drawing or music, from the grammar, with its exercise of the logical and discriminative faculty, to the reading, with its call for an exercise of the imaginative and expressive powers, are both in the line of true hygienic practice. Frequent alternation of mental employment is found in all good schools.

Too many persons, however, in adult years allow themselves to become engrossed in business, in money-getting or saving, to the extent that certain brain tracts are used almost exclusively, with the result that a break-down occurs at an untimely age.

An observance of the practical rule that we have stated, viz., of change or variety of mental occupation, would have saved many a man without having lessened in any degree his necessary application to business.

Insomnia has become an almost universal malady. Drugs are taken to counteract the abnormal excitement and consequent weakness of the affected nervous centers.

Far better would it be if the unfortunate victim of this insidious and insatiable foe to health and comfort were fought off by change of mental occupation rather than by drugs or other physical agents or sedatives.

3. Weak, Insufficient and Unbalanced Use.

Still again we have observed that a physical organ loses its functions, not only by disuse, by improper or excessive use, but by weak or insufficient use.

Just as a muscle needs to be exercised up to its full demands in order to be kept in a healthy condition, so the mind must be engaged to the full limits of its normal requirements. The best gymnastic culture demands that no one part of the body should be cultivated to the disadvantage of another.

The test of the strength of a chain is its weakest link; the test of mental efficiency is determined by its weakest power. If a man be deficient in memory, for instance, he will be unable to marshal the facts upon which a correct generalization depends.

Hence, to strengthen the generalizing power the weak memory must be cultivated. Each part is necessary to the whole. The strengthening of one part tends to strengthen the whole. Habits of careless and illogical thinking are to be guarded against, for they beget a mind prone to a limited survey only.

4. Careless and Inexact Use.

So, also, the habit of careless and inexact expression is fostered by an incomplete and hazy thought. A clear thought is the only one of value, and can always be clearly expressed if time and care are taken.

The common expression, "I know, but cannot express it," is not true; whatever is known clearly can be intelligibly stated.

The person that pleads the above excuse is one who does not think clearly; he has only a vague notion of what he would say. The relations and dependencies of the images that have risen into his consciousness have not been distinctly apprehended. Such thought should always be put to the test of clear and exact expression. No rule for mental growth is more important than the foregoing.

5. *Overfeeding the Mind.*

The mind should not be overfed. We are all familiar with the effects upon the body of overfeeding, namely, a clogging of the digestive apparatus, a disordering of the assimilative processes, and a general nervous disorganization.

There can be a healthy mental condition only when the mind's food-supply of sensations, images and thoughts is properly digested and assimilated.

Every afferent nerve that takes a message to the central ganglion, every nervous center that receives a message it cannot attend to by reading it off and converting its stimulus into motor activity, is acquiring a permanent habit, good or otherwise. One who accustoms himself to look over the daily newspaper in a half hour must guard against the danger of aquiring the practice of *reading without knowing*. Not the least by any means of the evils of this newspaper age, is the loose mental habit inculcated by the rapid perusal of the multitudinous columns of the daily press. Time was when a man having few books or papers, read to remember. Now, few men read to remember. Hence, the average memory is vastly below its former standard. It may happen that long before man develops into a hairless and toothless animal he will become a memoryless one, and need to carry around a pad and pencil in every pocket. It is a good rule every day to read something to be accurately remembered.

Not all that one hears or reads need be remembered—far from it; but more of our serious reading should be done slowly and carefully, that any valuable and permanent mental reaction may be had.

Prof. Poland also dwelt upon the following points: Inhibition of disagreeable sensations and images; introspection morbidly acute; simulation of agreeable states; and observation of the external signs of mental states in children and the treatment therefor.

SANITARY LEGISLATION.

BY JUDGE WM. M. LANNING, TRENTON.

It is a maxim with us, imbedded in most of our State Constitutions, that all political power is inherent in the people. A portion of this power has, by the Federal Constitution, been irrevocably surrendered to the National Government. The remainder has been left with the individual States. Amongst the powers thus reserved to each State is that of establishing rules and regulations for the "protection of the lives, limbs, health, comfort and quiet of all persons, and the protection of all property within the State." This power, called the police power, has, by the Constitution of each State, been vested by its people, subject to some restrictions, in its State Legislature, whose authority in this respect is, within the limits prescribed by the State Constitution, supreme. The National Government can neither take it away nor impair it. Its only authority over State police laws is to declare them void when they are found to transcend the powers reserved to the States and to invade the sphere of authority vested in the National Government.* The establishment of sanitary laws by the Legislature of a State is therefore the exercise of a police power, and all property and social rights are held subject to them, provided they do not contravene the provisions of the State or Federal Constitutions.

Within the sphere of police legislation, the provision of our State Constitution that, probably, has been most frequently disregarded, is the one providing that "the Legislature shall not pass private, local or special laws regulating the internal affairs of towns and counties." In construing this constitutional provision our courts have held that the word "towns" includes cities, and that a law is special if it excludes from its operation any city or county naturally embraced in the class of cities or counties to which it belongs.† It is probably not generally known that the act of 1880, establishing Local Boards of Health in this State, and that of 1886, which was a revision of the former act, came before our Supreme Court for review in the winter of 1886–1887, and, by excluding Hudson county from their operation, were upon the argument regarded as so plainly obnoxious to the constitutional provision referred to, that without waiting for the judgment of the court, application was made to the Legislature then in session, again to revise our sanitary legislation, which it did by the act now in force, approved March 31st, 1887, and made applicable to every city, town, township and municipality in the State. Except for this timely aid of the Legislature the people of the State would have been startled with a judicial declaration that not a Local Board of Health in the State was lawfully possessed of any power or had any legal existence.

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* Cooley's Con. Lim. (5th Ed.), p. 708; Wilkinson v. Rahrer, 140 U. S. 545.

† Pell v. Newark, 11 Vr. 550.

It has also often been insisted that the fourteenth amendment to the Federal Constitution, which provides that no State shall deprive any person of his property without due process of law, operates as a restriction upon the authority of a State to ordain police laws. But the Supreme Court of the United States has determined over and over again that such is not its effect, and that it does not interfere with the police power of the State to prescribe regulations to promote the health, peace, morals, education and good order of the people. Accordingly, a law which prohibits the manufacture and sale of intoxicating liquors, even though it renders almost valueless property devoted to such purpose before its passage, does not contravene the amendment referred to.* And the enforced removal of the manufacture of fertilizers from a densely populated neighborhood, although the removal necessitates the abandonment for such purpose of valuable property, is within the lawful police powers of the State.† It is only where a State Legislature, assuming to act under a power reserved to the State, in fact invades the authority vested in the National Government, or violates a right secured to the people by the Federal Constitution, that the Federal courts will declare the act to be void.

Having now seen that just police regulations prescribed by a State Legislature do not conflict with the Federal authority, and that the restriction in our State Constitution upon the exercise of the State's

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*Mugler *v.* Kansas City, 123 U. S.; Kidd *v.* Pearson, 128 U. S. 1.

†Northwestern Fertilizing Company *v.* Hyde Park, 97 U. S. 659.

police power relates rather to the manner of exercising the power than to the subject-matter of the regulations, it is obvious that the State Legislature may prescribe all such sanitary rules as it may deem necessary and expedient. It is not possible to fix definite limits to the exercise of such power. Under it, persons suffering from contagious diseases may be isolated; sources of foul odors removed; the sale of impure articles of food and medicine prohibited; the drainage and plumbing of houses inspected and supervised; vessels quarantined and passengers restrained of their liberty; infected goods and cargoes seized and destroyed; various trades regulated or prohibited within specified limits; vital facts and statistics gathered; men prohibited from the practice or sale of medicine who do not possess certain prescribed qualificatione. In short, the power of the State Legislature to ordain sanitary laws is adequate to all our sanitary needs.

The most familiar example of the exercise of the power for the protection of health, is the abatement of that class of public nuisances that give rise to noxious odors. Any person who keeps upon his property putrefying animal or vegetable matter injurious to the health of the neighborhood, may be indicted at common law for maintaining a public nuisance, without the aid of any special Legislative provisions. But such procedure does not remove the nuisance, and it is the right of any citizen to remove it without waiting for an adjudication that it is a nuisance. In such procedure, however, the citizen, if he destroys or injures property, renders himself liable to an action by the owner for damages, and unless upon the trial he can prove to the satisfaction of the jury that the thing removed was in fact a nuisance, and that in removing it he has done no more injury to property than was necessary, the owner will be entitled to recover from him the damage sustained. Such risk the citizen will seldom assume.

The evils that threaten the public health are often of such a nature that ordinary judicial procedure is too slow to secure proper protection. Hence arises the necessity, especially in densely-populated districts, of wise legislative provisions. The primary object of police legislation is to *protect* rather than to *detect;* to *prevent* rather than to *punish.* The Legislature, therefore, in the exercise of this peculiar power which we are now considering, may, by clearly defining what shall be prohibited, prescribe summary procedures for the protection of the public health. It may provide that skimmed milk shall be sold from cans so labeled, that every pound of oleomargarine sold shall be accompanied with a label of a prescribed size and character, that all other articles of food and all drugs shall be of a prescribed standard of purity, and that anyone violating any of such provisions may be punished by a summary judicial proceeding without a jury. It may, as it has in this State done, provide that all milk offered for sale that is not of a certain standard of purity may be poured upon the ground. In case of a suit brought by the owner of such property for its destruction, the defense is that the sale of the thing destroyed was absolutely prohibited, and its destruction authorized as a police regulation.* The wisdom of clearly defining what shall be prohibited, and appointing officers to enforce the law, is well illustrated in the act of our Legislature that authorizes the destruction of all horses affected with glanders. The Secretary of the State Board of Health ordered a number of horses suffering with that disease in one of the car stables of Newark to be shot. The company owning the horses instituted suit against the Secretary for the destruction of its property. The defense offered was that the horses were afflicted with the glanders, and that the act above referred to authorized the defendant, as an officer of the State Board of Health, to kill them, and the defense was deemed to be a complete one.†

A little reflection will, however, show that it is impracticable for the State Legislature to define, for every portion of the State, all acts that sanitary rules should prohibit. In order to provide a proper system of sanitary rules for any particular municipality, not only must the sanitary needs common to all municipalities be considered, but also its special needs, determined by its density of population, the character of its soil, its facilities for natural or artificial drainage, the location of its markets, the business carried on within its limits, and the like. Even if it were practicable for the State Legislature to provide rules adapted to the special needs of a particular municipality, it would be exceedingly difficult to do so without infringing the constitutional provision against special legislation. But the State Legislature may create municipal governments and invest them with local municipal authority. And while it cannot in general delegate its legislative authority, it can delegate to municipal governments (including townships) by a general law such legislative powers as reasonably pertain to such governments.‡

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* Shivers *v.* Newton, 16 Vr. 473.

† Newark Horse R. R. Co. *v.* Hunt, 21 Vr. 308.

‡ Howe *v.* Plainfield, 8 Vr. 149; Riley *v.* Trenton, 22 Vr. 498.

And it may distribute such legislative powers amongst various municipal bodies, giving to a Board of Fire Commissioners the power to prescribe rules for the government of the fire department, to a Board of Police Commissioners the power to prescribe rules for the government of the police department, to a Board of Water Commissioners the power to prescribe rules for the regulation of the water-supply, to a Common Council the power to adopt ordinances concerning the general municipal affairs, and to a Board of Health the power to prescribe health rules. This right of delegation was exercised by our State Legislature in the act entitled "An act to establish in this State Boards of Health and a Bureau of Vital Statistics, and to define their respective powers and duties," approved March 31st, 1887. By this act, and its supplements, after providing for the establishment of a Local Board of Health in every city, borough, town and other local municipal government in the State, it is enacted that every Local Board of Health shall have power to pass, alter or amend ordinances, and make rules and regulations in regard to the public health within its jurisdiction, for the following purposes:

1. To aid in the enforcement of the law as to the adulteration of all kinds of food and drink, and to prevent the sale or exposure for sale of any kind of meat or vegetable that is unwholesome or unfit for food.

2. To define and declare what shall constitute nuisances in lots, streets, docks, wharves, vessels and piers, and all public or private places.

3. To prevent the spreading of dangerous epidemics or contagious diseases, and to declare that the same have become epidemic, and to maintain and enforce proper and sufficient quarantine whenever deemed necessary.

4. To regulate, control and prohibit the keeping or slaughtering of all kinds of animals.

5. To regulate, control and prohibit the accumulation of offal and all decaying animal or vegetable substances.

6. To prohibit and remove any offensive matter or abate any nuisance in any public highway, road, street, avenue, alley or other place, public or private, and to cause the removal of the same at the expense of the owner.

7. To compel the return of all births, deaths and marriages by

physicians, midwives, nurses, clergymen, magistrates and other persons professionally officiating at any death, birth or marriage.

8. To secure the sanitary condition of tenement-houses, jails, prisons and all public buildings.

9. To regulate, control or prohibit the cleaning of sewers, the dumping of garbage, the filling of sunken lots or marshlands, and to provide for the filling up of such lots or lands.

10. To license and regulate persons to engage in the business of cleaning cesspools and privies, to fix the fees that shall be charged for each license granted, not exceeding twenty dollars per year for each vehicle or conveyance, and to require all vehicles and conveyances used in such business to be approved by the Local Board granting the license.

All Local Boards, except Township Boards, also have the power—

11. To regulate and control the method of construction, the location and the manner and frequency of the cleaning of cesspools and privies.

12. To compel, prescribe, regulate and control the plumbing, ventilation and drainage of all buildings, public and private, and the connection thereof with outside sewers, cesspools or other receptacles, and to require plans for the same, with necessary drawings or descriptions, to be submitted to the Boards for inspection and approval, and to require all master and foreman plumbers and all building contractors to register their names and addresses.

13. To protect the public water-supply and prevent the pollution of any stream of water or well, the water of which is used for domestic purposes, and to order not to be used, or closed, any well the water of which is polluted or detrimental to the public health.

14. To remove persons affected with communicable diseases to a suitable place, where, in the judgment of the Board, such removal is necessary and can be accomplished without undue risk to the person or persons diseased, and to disinfect the premises when deemed necessary.

15. To regulate the burial and disinterment of human bodies.

The delegation of powers thus made to Local Boards of Health gives ample authority to define clearly by their codes and ordinances what shall be prohibited, and so to secure to the officer who enforces their provisions the same protection as in the case of clear definition by the State Legislature. Since the Local Board of Health possesses no legislative powers not delegated to it by the State Legislature, its sanitary code should be so framed that the authority for each of its provisions will be readily discerned in one of the sources of authority above given.

In many of our city charters, which are special acts passed before the adoption of the constitutional provision against special legislation, there are delegations of power authorizing Common Councils to provide by ordinance for the *abatement* of nuisances, but not authorizing them to *define* nuisances. Under such delegation of power nothing injurious or hazardous to the public health could be abated that is not a nuisance at common law or has not been defined as a nuisance by an act of the Legislature. It is apparent, therefore, that a Local Board of Health which by its code or ordinance provides merely for the abatement of nuisances without defining them, fails to exercise one of the most important powers delegated to it.

But while Local Boards of Health may define nuisances, and provide for their summary abatement without judicial proceeding, and the officer removing a nuisance under such authority, may successfully plead that authority in his defense to an action for damages, it is equally important that there should be a clear definition of *all* acts of persons and conditions and uses of property which the interests of public health require should be forbidden. In a case where the offense against the ordinance is not a continuing one, as where one has sold an unwholesome article of food, or impure milk, or violated a provision concerning the dumping of garbage, or the cleaning or a cesspool, or where a minister or Justice of the Peace has failed to make return of a marriage, or a physician to make return of a birth or death, the act of 1887 provides that a summary judicial trial may be had before a District Court, Police Justice or Justice of the Peace, without a jury and without formal pleadings. The higher courts have uniformly held that to warrant the trial of an alleged offender against a statute or ordinance by a summary proceeding without a jury, the jurisdiction must be clear. Doubt upon this question is fatal.

A case occasionally arises, however, where the offense against a sanitary code or ordinance is a continuing one, and the abatement of which would be attended with consequences so great that no prudent health officer would assume the personal risk of deciding in what manner the evil should be removed. Such a case was that of the State *v.* Hutchinson, where the laundry and waste-water, and fæcal matter of a large hotel in Trenton were sewered into a small natural stream, giving rise to noxious odors. One of the defenses made in this case was that until the city had constructed sewers, which it had not then done, no disposition of the hotel's sewage less hazardous to health could be made. But the highest judicial authority of the State declared that a nuisance was clearly proven, and that if the city could not or would not provide a system of sewers, and if without sewers the proprietor could not devise a method of disposing of the sewage of the hotel without creating a nuisance, the hotel must be closed. Another defense was that the sewage of the hotel was conveyed to the stream through a private sewer, constructed by the proprietor of the hotel under a license granted by an ordinance of the Common Council. The court in answer to this defense said that the Common Council had no power to license an act, the natural result of which would be to create a nuisance.*

Another case possessing some similar features, decided by our Court of Chancery, was that of The State *v.* Freeholders of Bergen. In it, the Board of Health of Hackensack complained that the Board of Chosen Freeholders were sewering the county court-house and jail into a small natural stream flowing through the city, and thereby creating a nuisance hazardous to the public health. The city had no sewer system with which the court-house could be connected. In that case the court found that the creation of a nuisance by the court-house sewer was not proven. But if it had found otherwise it is by no means certain that it would have ordered the discontinuance of the sewer; for the opinion contains an intimation that a distinction might be made between the sewering of a county court-house and jail, which the law requires to be maintained, and the sewering of a hotel, the maintenance of which is not required.†

Another case was that of the proprietor of a large tomato-canning factory who conveyed the refuse matter of his factory into a natural stream, thereby causing foul odors and threatening the public health.‡

And another, that of the proprietor of a soap factory from which sickening odors emanated.§

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* Hutchinson *v.* Trenton Board, 12 Stew. 569.

† State *v.* Freeholders of Bergen, 1 Dick. 173.

‡ State *v.* Butterfoss, 13 Stew. 325.

§ State *v.* Niedt; a Mercer county case not reported.

These cases presented important questions for consideration, and he would have been a bold man who in any of them would have dared to abate the nuisance or stop the act complained of, without first having obtained the authority of a judicial decision. And, happily, by a provision of the act of 1887, such authority in any proper case need not long be delayed. Any Local Board of Health, instead of proceeding in a summary way to abate a nuisance, may apply to the Court of Chancery for an injunction and have the matter adjudicated according to the practice of that court. This, indeed, was the course pursued in the last four cases to which I have referred. It is the better course in all cases affecting important industries. And even in every such case the Board of Health asking the aid of the Court of Chancery should be able to show what particular section or sections of its code or ordinance have been violated. Unless it can do so, it must show its right to the aid sought, under some general provision of the act of the State Legislature.

It cannot be too strongly impressed upon the minds of health officers that the State Legislature has left it to each Local Board of Health to perfect by its code or ordinances such a system of rules as may, in its judgment, be necessary for the protection of the public health within the limits of its jurisdiction. Without such a system there can be no summary trials and no adequate protection. It is true that the act of 1887 does provide that the power of a Local Board of Health to abate a nuisance hazardous to the public health shall not depend upon the previous adoption by it of a code or ordinance in relation thereto, but as already intimated there are many acts which may properly be prohibited by code or ordinance, that are not recognized as nuisances at common law, and are not so defined by any act of the Legislature.

I have frequently been asked by health officers as to their powers in doubtful matters which might easily be made certain by code or ordinance. We do not so much need additional legislation by the State, as additional and intelligent legislation by Local Boards of Health. Having personally had no hand in the preparation of the sanitary code of Trenton, I feel free to say that I consider it a model of excellence in so far as the Local Board of Trenton has thereby attempted to exercise the powers conferred upon it. Although the Board has in this code exercised power under thirteen of the fifteen sources of power mentioned, it has exhausted none of them, for the State law is so general in its terms that it authorizes the addition to the code of new provisions as often as the public good may require. Whatever defects may exist in the administration of sanitary law in our State must therefore be due chiefly to the failure of Local Boards to provide proper codes or ordinances, or, if they have provided them, to their failure properly to enforce them.

The act of 1887 provides that the various Local Boards may, for the purpose of enforcing the provisions of its code or ordinances, appoint Health Inspectors and Agents. Each Board should appoint a sufficient number of these officers to insure proper inspection of its health district. We not only provide laws against the employment of young children in factories, but, in the exercise of our police power, we also appoint Inspectors, whose duty it is to visit the factories of the State to ascertain whether the law is violated, and if so, to bring the offenders to justice. And so in the all-important matter of preserving health, a Local Board should not only adopt good and wise sanitary rules, but should provide for their vigorous enforcement by the appointment of men whose duty it is not to sit still until some one shall complain of the violation of a sanitary rule by a neighbor, but to visit frequently the various parts of their respective districts and *inspect* those parts, ascertain who are in any manner violating the code, and advise, warn or sue, where advice, warning or suit is necessary. Not only should the code clearly define what should be prohibited, as I have already observed, but it should also as clearly define the duties of Inspectors and Agents.

The acts of the Legislature of our State for the protection of health and the record of vital statistics, embracing, as they do, the act of 1887, already more than once referred to, and its supplements; the act for the certification of marriages, births and deaths, and the vital facts relating thereto; the act to prevent the adulteration of food or drugs; the act to regulate the cutting and sale of ice in cities; the act to prevent the adulteration and to regulate the sale of milk; the act to regulate the practice of pharmacy, and others that might perhaps be named, contain provisions far in advance of the local legislation of our Boards of Health. To be effective to such an extent as the State Legislature has intended, these acts must be supplemented by proper local legislation.

Local Boards need to be frequently instructed concerning their powers and urged to exercise them. Such work has been for years efficiently carried on by the Secretary of the State Board of Health. Under his wise administration popular prejudice against the execution of sanitary law is disappearing. The people are more and more appreciating the advantages of such law, and in the place of offering obstacles to its enforcement we find that it is now the common experience of Local Boards to be besieged with petitions for the abatement of this or that nuisance or the correction of this or that evil. When Local Boards generally shall better understand their powers and shall ordain and enforce reasonable rules for the sanitary welfare of their respective health districts, we shall have a greatly-improved sanitary system.

In concluding this paper, I have but two suggestions to make respecting additional State legislation. The act of 1887 gives to the Local Board of a city, town or borough the right to draw annually on the treasury of its municipality for a sum not exceeding five cents for each inhabitant, unless the Common Council or other governing body shall have consented to the appropriation of a larger sum. Is it not absurd to expect that a Local Board, composed of intelligent men, who have informed themselves as to their powers and who are willing and desirous of executing them, can, with an annual allowance of $3,000 in a city of 60,000 inhabitants, properly execute the fifteen powers delegated to such Board? For the larger cities, at least, greater discretionary power should be given to Boards of Health as to the amount of money that may be expended.

The other suggestion is, that the State Board of Health should have the right to apply to the Court of Chancery for an injunction to restrain a nuisance or a business hazardous to the public health in all cases in which the proper Local Board fails to act, and in all cases where the nuisance or business affects the health of citizens within the limits of two or more sanitary districts.

TRAPS AND VENTS ON SEWER OR SOIL-PIPES AND THEIR USES.

BY E. M. HUNT, M.D.

If the pipes through which soiled liquids and floating solids pass from the house to the common sewer, as well as the sewer itself, could be of smooth and unabsorbent material like glass, and if we could always be sure of an unvarying draught outward and through the sewer to its outfall, traps would not only be useless but hindrances. If, as is the case, pipes of the best construction and grade will retain a slight coating of decayable matter and odors of foul particles or gases, we are able to reduce these to a minimum by a free ventilation and by doing all we can to promote downward and outward currents. While, to a small degree, we may avail ourselves of heat to promote draught, we are to know that this also promotes decomposition where there is moisture.

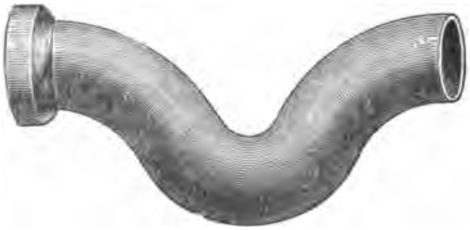
Because we are not able to rely on the cleanness of pipes and the absence of decaying particles and gases, or upon a constant and complete ventilation and outward draught, we resort to traps.

A trap, therefore, is a device for breaking the air or draught connection between parts of a pipe or sewer system, so that gases cannot pass through its length and so enter a building.

It is now generally agreed that there should be a trap near each fixture, between it and the main soil-pipe, and a trap on the main soil-pipe where it leaves the building.

It has been objected to this trap on the soil-pipe where it leaves the house, that it impedes ventilation, slows the flow of sewage, and is apt to have foul matter lodged in it. These objections are inconsiderable, since they can be fully compensated for by other ventilation, and by sufficient fall of pipe and flow. Without a trap we have too little assurance that gases and particles from the sewer or cesspool will not reach the house system. This outside or intermediate trap should have passing from it a ventilating pipe, and should be of size and inclination and depth suited to the size of other pipes and to the amount of liquid it is to carry. When good fall cannot be had it can be supplemented by artificial flushing, or there are rare cases where the trap may be omitted.

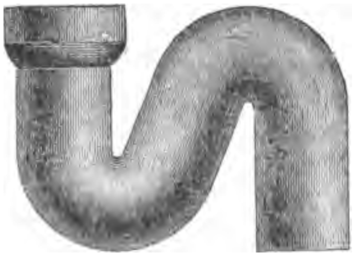
In order that traps may afford a seal and yet be self-cleansing, they should never be larger in bore or caliber than the waste-pipe they receive their liquid from, and should have such bend, setting and inclination as to give fall and yet have a dip or depth of water-seal of two inches, the variation from this, as a rule, not being over a half inch, as modified by circumstances. If they can be arranged with cleaning screws to which access can be had, so much the better.



RUNNING TRAP.

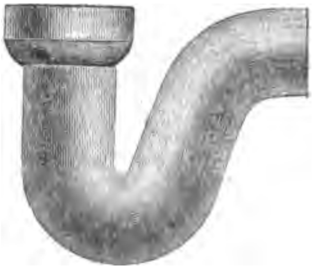
The simplest form of trap is the running trap. A running trap is simply a U bend in a horizontal pipe for the purpose of forming a water-seal.

By a bend or dip in the metal of the pipe a small bowl is formed, which holds enough of the passing liquid to make a seal.



S TRAP.

An S trap is an S bend in a vertical pipe for the purpose of forming a water-seal.

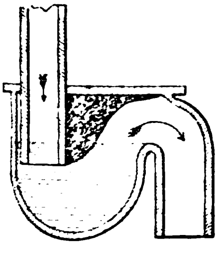


HALF-S TRAP.

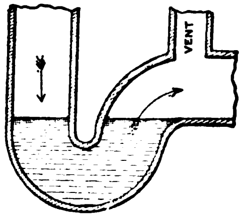
A half-S trap is where a vertical pipe is connected with a horizontal one, so that by what is called a half-S bend a trap is formed with a vertical inlet, and a horizontal outlet serves to form a water-seal.

It is sometimes objected to these and other traps depending alone on water as a seal, that water can absorb foul gases and particles, and so pass them from one part of the pipe to another. Carmichael, Frankland, Pumpelly and others have shown that the experiments of Fergus do not represent what takes place in actual use, and that practically the water-seal, when continuous and sufficient in depth, can be relied upon.

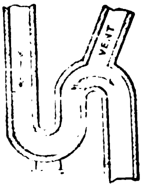
While in some localities and in special conditions other traps are to be recommended, the running and S traps are likely to be the chief reliance in house-plumbing.



D TRAP.



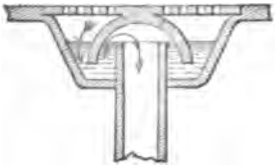
P TRAP.



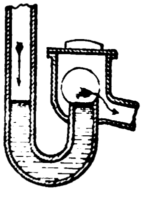
S TRAP.

As, however, there are possible cases in which other forms of traps may be used or when the usual water-seal of these traps is liable to be broken, traps are generally spoken of as of three kinds—water-seal traps, mechanical traps, mercury-seal traps.

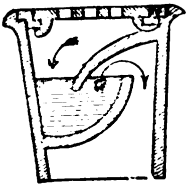
Of the first we have already given examples (D, P, S), but as there can be variations in shape, in direction, in material, in mode of access, there are such modifications as the ordinary bell trap, Buchan's trap, Antill's trap, Adee's trap, Putnam's Sanitas trap, the Puro trap, the bottle trap, &c. These are traps with tortuous passages.



BELL TRAP.



BUCHAN TRAP.



ANTILL'S TRAP.

The chief point claimed as to most of these is that by change of shape, direction of flow and slight devices they do not admit of easy siphonage or discharge of the water-seal. This difference is generally claimed to be secured by changing angles or the line of direction and impetus of flow of the water through the trap. We here select a description of the Puro trap from the "Sanitary News" (1891), because it gives the chief points which distinguish this class of trap:

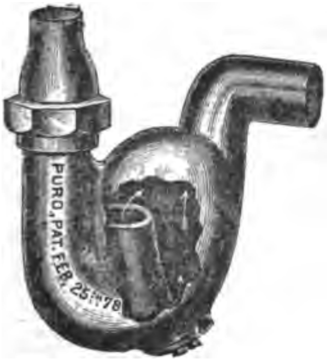
"THE PURO TRAP.

"There has never been any question that all the *positive* requirements of a trap are best fulfilled—indeed almost ideally fulfilled—by the plain S trap. Its interior is smooth, its water-way is free, and its self-scouring quality is complete. But it has one defect; it is subject, under certain conditions, to siphonage. Hence, the problem seemed to be to preserve all the good qualities of the S trap and eliminate its one weakness.

"The usual answer to this problem has been and is the use of a vent-pipe from the trap to the outer air; but this device is often cumbersome, costly and frequently ineffective. A recognition of these facts has stimulated invention in a rather remarkable degree, and the result is a large number of traps, differing in form, but all seeking the same end, and few without some merit. The trouble has been that inventors have, as a rule, avoided one defect by running into another.

"The chief danger recognized has been siphonage. To avoid this, traps have been made of such large capacity as to diffuse the water entering them, making them slow of discharge, not self-scouring, and hence retaining deposits. Others have had so many bends and angles and corners unwashed by the flow as speedily to fill up with filth. Others have had moving parts liable to wear out and to derangement Still others have had mechanical obstructions to the flow, preventing not only their own scouring, but also the proper flushing of the waste-pipe.

"In the Puro it is claimed that all the advantages of the S trap have been retained, that its liability to siphonage has been obviated, and that no advantage has been gained in one direction at the cost of a defect in another. It is made of brass or lead in P and S forms.

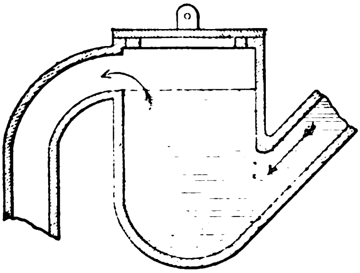


THE PURO TRAP.

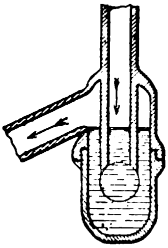
"The cut shown is that of the P trap. In shape it is an easy curve. The interior of the trap proper is perfectly smooth and rounded, and the diameter of the enlargement is about double that of the inlet. A small partition or funnel is formed near the bottom of the trap. Were this omitted, the trap would be effective to a certain degree, but its interior would not all be scoured, and in case of siphonage, much of the water could be thrown out. This funnel serves two purposes. It will be noticed that its outer wall is set at a slight angle to the line of flow. Hence, while most of the water in discharge passes across its mouth at the bottom, a small proportion is deflected and passes upward through its interior and is thrown in different directions against the upper portions of the trap, thus creating as it were an artificial scouring of those parts against which the water otherwise would have but little force. The second office of this funnel is to facilitate the admission of air into the trap from the inlet side when the discharge from the fixture above ceases, or in case of siphonage from the discharge of other fixtures, and thus to save as much as possible of the contained water for a seal. Experiments with siphons have shown that air entering at the crown of a siphon acts much more quickly in arresting siphonage than when taken at any other point. In the case of the

Puro trap, the water flowing up through the funnel is much broken and mingled with air, and through this channel air finds a much more ready admittance to the crown of the trap than if it were obliged to struggle up through a solid mass of water. This sudden 'breaking' at the final moment of discharge enables the trap to retain a large portion of its water, enough indeed to give it a good seal, even though no tailing flow filled it up again to its overflow point. On this facility in the admission of air the Puro trap rests its claim to be non-siphonable.

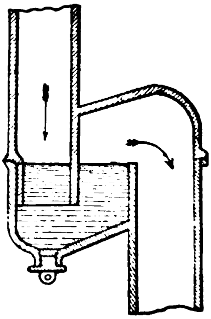
"The funnel, which at first sight might appear to be an obstruction to the flow, has in fact quite a contrary effect. The strongest flow in any part of the trap is across the bottom of the funnel, which is found in practice to act as a *vena contracta.*"



Rounded Form of Bottle Trap.



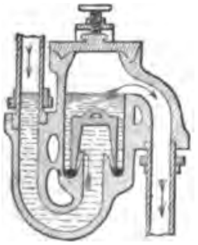
Bower Trap.



Adee Trap.

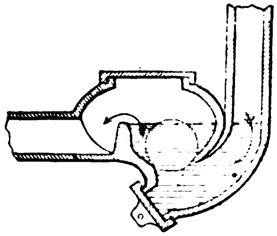
The Adee trap and the rounded form of the bottle or pot trap are also water-seal traps with slight modifications.

Nicholson's Mercury-Seal Trap.

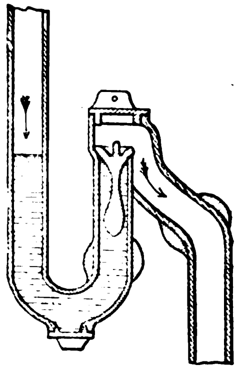


~~Cudell's Trap.~~

Cudell's Trap.



~~Nicholson's Mercury-Seal Trap.~~

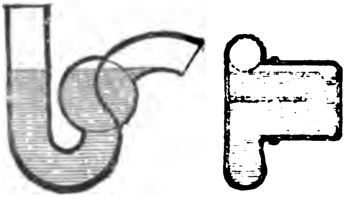


Waring's Check-Valve Trap.

We illustrate the mechanical traps by Bower's, Cudell's and Waring's, and the mercury-seal traps by Nicholson's.

Mechanical traps are those in which the water-seal is largely supplemented by some device for sealing, such as balls, valves or floats. One of those in common use is the Bower trap, in which a floating india-rubber ball helps to insure perfect closure. Cudell's trap, in which the closure is by the weight of a metallic ball, and Waring's check-valve trap, which has a valve-seal closing by its weight, depend upon similar principles. All those traps which close by gravity may be prevented from close shutting by small particles, strings, &c.

Mercury-seal traps have, in addition to the water-seal, a column of mercury, of which Nicholson's mercury-seal is an example.



PUTNAM TRAP.

The Putnam trap, or Sanitas trap, while belonging to the first class, is so elaborate in construction and shape as almost to be classed with the second order. It seems to preserve the scouring advantages of the ordinary S trap, and yet by its shape to be less liable to siphonage.

Mr. Putnam, in his articles on sanitary plumbing in the "American Architect" (1883–4) has well specified the characters of an improved trap. Some of the points are these:

(*a*) It must so utilize the water-seal as to need no other.

(*b*) Must be capable of resisting the severest tests of siphonage, momentum and back pressure.

(*c*) Must contain sufficient depth of water to be practically safe against evaporation.

(*d*) Must admit of inspection and cleansing, and

(*e*) Offer the minimum of resistance to the flow of the water.

It is well, also, for the Inspector to notice the thickness and material of traps, since the metal may be of poor kind or quality, too thin or have sand-holes. Thus, the "Du Bois" traps or drawn-lead pipes are, as a rule, better than those of the same material cast in a mould.

EMPTYING OF TRAPS BY SIPHONAGE AND EVAPORATION OR CAPILLARY ACTION.

Siphonage is the effect produced by a partial or complete vacuu in the waste or soil-pipe beyond the trap. The effect of this is t draw or let up the contents of the cup or downward bend of the tra so as to permit the passage of air or gas.

Emptying by momentum or back pressure or by suction is generally included in siphonage. The terms suction of gas or air pressure, as used in connection with siphonage, chiefly occur as follows:

Traps on a long and steep line of waste-pipe, or which have a easy bend, or with a small dip or depth of seal, are liable to empt themselves by the momentum of a body of water rushing throug them, which, passing beyond the trap and filling the pipe, will caus a vacuum behind it.

Water running through a larger pipe, as the main soil-pipe, als by its momentum may suck the air out of a smaller pipe which join it, and so empty its pipe. The pressure of pent-up air or gas ma also by its back pressure push the water out of a trap. These effect somewhat correspond with the plenum and exhaust methods o ventilation.

Evaporation empties a trap simply by giving up its water to air, and of course is most liable to occur in traps of small dip, bend o water-seal, in those out of use and in those that have free ventilation.

The siphonage of traps by capillary attraction takes place when fo any reason a siphon is formed by a string or other particles, and th water so conducted out of the seal.

"'The Hydraulic Plumber,' some time since, discussed the effects of siphonage, or rather, of combined siphonage and capillary attraction, often produced in traps through the medium of bits of cloth, or strings of matted lint and hair, which catch in the outlet of the trap, and hang down, with one end in the dip of the trap and the other extending down the outlet pipe. Every one knows that a wet towel, hung over the side of a wash-basin, will soon draw all the water out of the basin, and the mat of lint and hair on the edge of a trap seems to act in precisely the same way. In illustration of the principle, a correspondent relates a story of his employment, some time ago, to investigate the causes of a foul smell in a certain bath-room, where other plumbers had worked before him in vain. The pipes had been swabbed out; the closet, an old-fashioned pan apparatus, had been burned out, and disinfectants applied, in vain. The wastes of bath and wash-basin, according to the old practice, entered the water-closet trap, but no sign of leakage could be discovered about this or the waste-pipes. The new plumber, not knowing what else to look for, removed the closet and filled the trap with water. As soon as the agitation had ceased he measured the depth of the water, and then left it to itself for twenty minutes. At the end of that time the water-level had fallen half an inch. Twenty minutes later it had fallen still more, and in an hour the seal was so far broken as to allow a slight current of sewer air to enter the room. The plumber then left the room for two hours, locking the door and taking the key with him. When he returned the place was full of foul air, and on passing his hand under the bend of the trap he found a space of about an inch and a quarter between the surface of the water and the underside of the bend of the trap. The next step was to cut away the crown of the trap so as to expose the upper portion of the bend. An opening was made, four inches long and three and one-half inches wide, but examination through this showed nothing out of the way until the trap was refilled, when a wet line was observed over the bend, which proved to follow the course of some hairs, twelve or fifteen in all, which had been caught, together with some lint and ravelings, in the slimy lining of the bend. By detaching the lower part of this collection from the walls, allowing it to hang down free in the outlet-pipe the water was observed to drip from the end at the rate of seventy or eighty drops a minute. The whole was then cleared away and the closet replaced, and no more trouble was experienced. The plumber in question then made some very interesting experiments to ascertain the amount of conducting substance necessary to cause the emptying of traps in this way, using a small beaker glass in place of a lead trap. He found that with five pieces of number eighty spool-cotton, about seven inches long, hung over the edge of the beaker, the water-level was lowered three inches in nineteen hours, and one-half inch in about fifteen minutes. With five long hairs the lowering amounted to one inch in ten hours, and three inches in about a day and a half. With five hairs and two threads, of the same size as before, the lowering in seven and one-half hours was one and one-half inches. One piece of cotton twine lowered the water three-quarters of an inch in four and one-half hours. Two pieces of twine drew over an inch of water in two hours, and two inches in less than four hours. A bit of cotton cloth, half an inch wide, siphoned over three-quarters of an inch of water in an hour and a quarter. As nothing is of more common occurrence in drain-pipes than lint or hair, it seems likely that this observation will explain many cases of offensive odors in bath-rooms and bed-rooms not otherwise to be accounted for."

In traps not too large and well flushed this can very seldom happen. While siphonage does not occur as frequently as sometimes asserted, it is easy to see that with an imperfect understanding o how it may occur, it may often result by the ignorance of plumber or the carelessness of house occupants.

The chief means of prevention are as follows:

As great a dip or depth of seal as is consistent with proper scouring of traps.

Such shape and setting of traps as will reduce the chances of it t a minimum or prevent it, as is claimed for some mechanical traps.

Extending of the main soil trap, of full size, to the roof, with it top open, and also an opening at the lower or basement part of th pipe, where it leaves the building.

The venting or ventilation of the trap by extending from it ar open pipe directly to the roof.

This last is now the usual way of securing such local venting o trap as will insure against siphonage. It meets with the approval o most authorities and is included in the specifications of many plumbing laws.

There are those, however, who claim for it some disadvantages, such as the more rapid evaporation of water in the trap, and that it is unnecessary, because traps can be so located as to have little or no risk of siphonage, or can be secured against it by mechanical devices.

In a recent discussion in the "Sanitary News," of Chicago, these views are well presented, and so we quote freely from Col. George E. Waring and a writer who signs himself A. J. T.

THE BACK-VENTING OF TRAPS.

"It is assumed by some that unless a trap is back-vented it is sure to lose its water-seal by siphonage; and that if it is back-vented, the water-seal cannot be withdrawn. Neither of these assumptions is true. Many traps are so placed that they are by no means subject to siphonage, and traps which are necessarily subject to the suction which would produce siphonage may have fresh air supplied to them by a much simpler, less costly and more effective method (McClellan trap-vent), or, which is still better, may be replaced with traps (like the Sanitas and Puro) which no amount of suction and siphonage that can occur in house-drainage can rob of their seal. The use of the back-vent pipe prescribed is by no means always effective in preventing siphonage. If there were a hole in the top of the trap nearly as large as its interior diameter, sufficient air to supply the suction would always enter and prevent the disturbance of the seal.

If this hole were connected with a pipe a few feet long, it would still be secure. The larger the hole and the larger the pipe, the longer the pipe may be and still produce the same effect; but in practice we soon reach a point where the inertia of the air in the pipe and its frictional resistance to the movement of air require more suction to set up a current that is required to move the water-seal. This has been demonstrated in detail by ample, carefully-conducted experiments.

"I found in my experiments that under the ordinary conditions of house-drainage the free ventilation of the soil-pipe sufficed to prevent unsealing. Mr. Helyer found that with a properly-ventilated soil-pipe it took ten discharges of a water-closet to cause a small trap connected with the lower point of the soil-pipe to lose less than one-half of its 1¾-inch seal. Mr. Philbrick tried a 2-inch trap on a 2-inch waste with a 1-inch vent-pipe less than thirty feet long. Its seal was 1⅝ inches. In nine experiments with a discharge through it of a pail of water, it lost its seal twice. Substituting a 1½-inch vent fifty feet long, this trap lost one inch of its seal in five trials out of ten. With a 4-inch trap on a 4-inch soil.pipe with 1⅞-inch seal and a vent-pipe 1½ inches in diameter and one foot long, the discharge of a pail of water destroyed its seal three times out of ten. Increasing the vent to two inches, the discharge of six pailfuls broke the seal once and nearly broke it twice. Increasing the vent to three inches, ten pailfuls broke the seal once and reduced it to less than one-half its depth six times. He also says: 'Under conditions which indicate perfect security, with a pipe one foot long and one and a half inches in diameter on a four-inch trap, a coil of pipe fifty feet long coupled to the vent rendered it inefficient once in eight trials—the trap, having two inches seal, being siphoned in this case—and lost one inch of water three times out of the eight. In another case, where a short vent of one inch in diameter seemed to be quite efficient, a coil of 1-inch pipe, with a length of twenty-eight feet and six inches, being coupled to it, rendered the vent of apparently little use, for the trap lost its seal at every trial.' He concludes that with ordinary hopper closets used for emptying slops, 'it is difficult to preserve the seal in the ordinary form of S trap, even by a vent-pipe attached thereto, unless this be applied directly to the crown of the trap, and be as large as four inches in diameter for at least a foot above the trap.'

"Putnam, in a long and elaborate series of experiments, reached a conclusion no more favorable, and found that it made a great difference whether the vent-pipes were straight or coiled. Short bends are worse than the larger bends of a coil of pipe, and short bends are indispensable in the modern practice of trap-venting. Aside from the inefficiency of back-venting as a preventive of siphonage, it has the very serious objection that it brings a current of air into close proximity to the trap, tending to lessen the sealing-water by evaporation. This is a serious and constant danger. It may indeed be believed that the existing back-venting of traps, carried out under the plumbing regulations of different towns in this country, results much more often in emptying traps by evaporation than it does in preventing siphonage by furnishing air to the suction.

"Then again, the trap-vent at the crown of the trap is very liable to become reduced in size, or entirely closed, by the accumulation of sticky matters thrown against it, so that even where a vent-pipe is effective when it is new, it becomes ineffective after a little use. In short, it is an unsafe reliance, and is rarely, if ever, to be depended on with entire confidence.

"I venture the opinion that the back-venting regulations would never have attained their wide influence and popularity, had they not opened a field for a great increase of work and profit for the plumber. They increase the cost of plumbing-work very much and are an apparant advantage to the trade by which they are supplied. It is not unlikely, however, that the cheapening of house-drainage which the abandoning of this system would secure, would ultimately greatly increase the amount of plumbing-work to be done. So far as back-venting pipes are made of lead, they are objectionable because subject to injury from the careless driving of nails and from the gnawing of rats, either of which may cause an unsuspected opening between the foul air contained in the drainage system and the interior atmosphere of the house.

"I have no hesitation in saying that, in my judgment, all ordinances and regulations requiring the back-venting of traps by special pipes communicating with the air above the roof, or with the upper part of the soil-pipe, should be abrogated, and that some reliable trap, that will hold a sufficient water-seal in spite of any amount or continuance of suction that can be produced in house-drainage, should be required to be used in all positions where there is a liability to siphonage.

"It may not be improper for me to add that I consider myself in matters of house-drainage a thoroughly practical man; that I have no interest whatever in the Sanitas trap, the Puro trap, or any other 'combination' trap; and that neither the Sanitas nor the Puro ever holds any deposit whatever, ever has its water-way reduced, ever approaches the condition of an S trap, or can ever have its seal broken by any conditions occurring in house-drainage.

"Respectfully yours,

"GEO. E. WARING, Jr.

"February 7th, 1891."

Another writer (1891) speaks thus:

"On the subject of back-venting and combination traps I will briefly state some experience of my own. I had long been an advocate of back-venting, and would listen to no argument in favor of combination traps, as I was told that they were filthy, liable to siphonage, and generally unreliable.

"It so happened in my experience that I plumbed a three-story and basement flat building, using the best method of back-venting, and afterwards occupied one of the lower apartments myself. I felt very comfortable in regard to the reliability of the plumbing; for had I not done the work myself in accordance with the most approved system? But I was not long in the building until I began to study that system and look into it very closely. My attention was first called to the matter by observing a rumbling sound in my wash-basin every time the fixtures above were discharged. I investigated and found that the bubbling sound proceeded from above the back-vented trap, and not below it. I then made experiments and found that at every discharge the basin trap lost a portion, and often all, of its seal. This satisfied me that the plumbing was not right. I examined the vent and found it clear, unobstructed to the top. I removed it at the trap-crown to examine more closely the trap, and found that, with the vent disconnected in this way, the trap did not siphon, nor was the seal at all disturbed by the discharges. I could come to no other conclusion than the length of the vent-pipe, the inertia of the air and the friction along the pipe wholly destroyed the efficacy of the vent, and left the trap subject to the breaking of its seal at every discharge of any of the fixtures connected with the system.

"To remedy this plainly-discernible evil in my pet plumbing job, I procured a Bower trap, and with it replaced the S trap and vent. It has now been over three years since this was done, and I have a perfect seal all the time, and I have not touched the trap once. I likewise replaced all the traps in the flats, and now live in perfect comfort and security regarding sewer-gas. Since then I have seen this trap tested in every way possible, and it has never failed. I do not wish to be understood as disapproving of other traps of this general character. There are the Cudell, Sanitas, Puro, 'Clean-Sweep' and others—all good traps; but I use the Bower because I have found it efficient. I do not particularly advocate any one trap, but cannot advocate back-venting under all circumstances. In fact, I find few conditions where I would use it at all. The McClellan vent is practical and effective under many conditions, and all these, in the large majority of cases, are to be preferred to the back-vent.

"Let us look a little into the reasons for this conclusion, having seen the facts on which it is based. The three principal causes that produce the effect of unsealing a trap are siphonage, evaporation and capillary attraction. In regard to capillary attraction, it is just as likely to occur in a back-vented S trap as in any other, so in that matter it is a 'stand-off;' but when the S trap has lost its water-seal it has no seal whatever, and its form naturally contributes to capillary action. In the matter of evaporation we find in the back-vented

S trap about all the conditions necessary for unsealing the trap in this manner. We have changing air in contact with the water-seal, an air-current carrying off the vapor, and air-pressure on the house side of the trap, which aërates the whole of the seal, producing the conditions for rapid evaporation. We do not have any of these conditions in the 'combination traps.'

"As regards siphonage, the theory of back-venting is plausible, but the practice is a 'vexation of spirit.' A short vent-pipe, if large enough, will prevent siphonage; but to find this condition in general plumbing-work is very rare. The theory of back-venting includes that of ventilation, and a current of air is supposed to be moving *up* the pipe continually. If we accept a theory in one particular we must in all, and the back-vent, in order to prevent siphonage, must have this current of air reversed and made to rush *down* the pipe. Here we have to overcome this ascending velocity of the air, its dead weight, and the frictional resistance of the pipe. I have found, to my own satisfaction, that all this resistance is greater than that of the seal and short pipe to fixture, and the seal gives way first.

"In conclusion I wish to state that back-venting is efficient where the length of pipe and its size afford a less resistance than the water-seal; but when this is passed, which is the case in the majority of buildings, this system is ineffective, and a resort to a 'combination trap' seems to me to be wise. A. J. T."

Instead of the back-venting of traps, to prevent siphonage, besides the various modifications of traps, Dr. E. S. McClellan, of this State, has invented an "Anti-Siphon Trap-Vent," which has come into extended use. It is well described in an article by Prof. J. E. Denton, of Hoboken, in the last volume (1890) of the American Public Health Association. We give here a sectional diagram of it.

There can be no doubt as to its successful use and its adaptation to many conditions.

Figure 4 is a sectional view of the body, A, and the bridge, L, with a perspective view of the cup, B, and thimble, C, in their normal position.

Figure 5 is a sectional view of the body, A, the screw nipple, E, the nut, F, the solder nipple, G, a perspective view of the thimble, C, in its normal position, and of the cup, B, lifted out of the mercury-seal by the air-pressure against its under surface, and admitting a free inflow of air, as indicated by the arrows. As soon as the demand for air is satisfied, and the equality of pressure re-established between the air in the room and the air in the pipe, the cup drops back, by gravity, to the position shown in Figure 4.

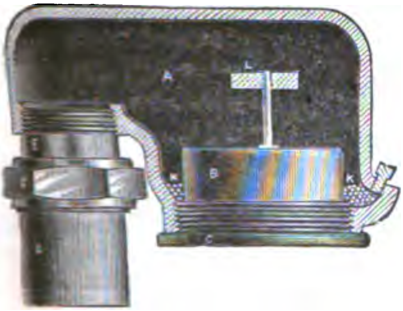


FIG. 4.

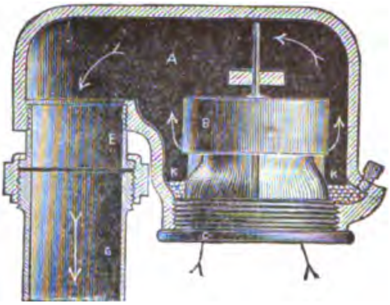


FIG. 5.

K is a mass of mercury resting in the annular groove between the body, A, and the thimble, C, and serves to seal the edge of the inverted cup against the passage of sewer-air into the apartment.

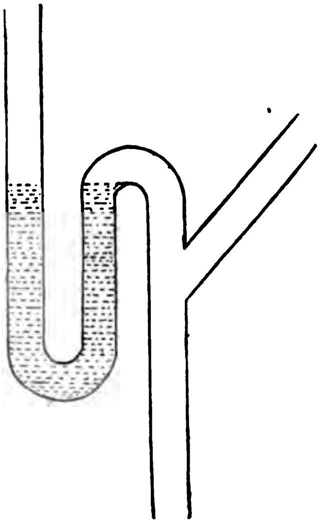
L is a bridge to support the guide pin of cup, B, as shown in Figure 4.

We give these statements because the efficacy of venting is so generally accepted, and so it is proper to consider methods in which it can be dispensed with. We do not wish to be understood as indorsing these views except so far as believing that the expensive method of venting all traps should be so far modified as to inquire more accurately into the possibility of locating traps so as to avoid siphonage, and also into that class of cases in which the mechanical traps are cheaper and equally reliable.

Where traps are vented the vent generally starts from the crown. We give, however, the view of Mr. Kelly, a practical plumber, who claims that the vent ought to start a little beyond this, on the downward bend of the pipe. He speaks thus:

"Some claim that the only proper way to ventilate a trap is from the crown of the trap. I claim that, according to my idea, that is an improper way, for it brings the air-pipe so close and directly over the seal that the seal is endangered by evaporation, and the vent is endangered also by becoming stopped up with filth thrown up by the action of the water. The proper place to connect the air-vent is below the crown and above the bottom of the trap, so as to bring the branch on a level with the center of the water in the trap, and the vent should always be taken from the waste-pipe and not from the trap, with a Y branch, as illustrated in the cut.

"It is clear to me that by doing this the action of the water passing the air-branch causes the air to start gradually, and relieves the trap and the air-vent of that sudden strain which takes place when



the fixture is emptied. I have not received those ideas from theoretical experiments but from practical experience, and my ideas are theoretical and practical."

In long lines of soil-pipe, as on high buildings, the fixtures are more apt to siphon, and the vent pipes must be of larger diameter to compensate for the effects of friction. Where traps are not in use, if glycerine or oil is let into the trap it will not evaporate. Many, when houses are vacant, leave a very slight drip from some faucet. These few facts will aid Inspectors in their examination of house fixtures and prepare them for the use of such an excellent manual as that of W. P. Gerhard, C.E., on House Drainage or Sanitary Plumbing, or the many larger works which discuss the whole subject more fully.

NOTE.—We hereby acknowledge our great indebtedness to W. P. Gerhard, C.E., of New York City, for the use of several of his cuts of traps, as well as to his publishers, D. Van Nostrand Company, 23 Murray street; also to Dr. E. S. McClellan, and Du Bois Manufacturing Company, 245 Ninth avenue, New York City, for use of cuts.

For convenience of reference we add hereto a few facts as to pipes, traps and siphonage in the form of question and answer:

Q. How can a trap be emptied or unsealed?

A. By leakage, evaporation, siphonage or air-pressure.

Q. Explain leakage?

A. Leakage from the cup of the trap may be due to an imperfectly-fitted trap-screw at the bottom of the cup or downward bend; or to an opening in the walls of the trap itself, due to defective material or workmanship; or, in case of a very old trap constructed of soldered lead, to corrosion and decay in the metal, usually at the joints.

Q. Under what circumstances does evaporation unseal traps?

A. The traps of fixtures not in ordinary use, such as fixed wash-bowls in spare bed-rooms, are liable to be unsealed by evaporation if the precaution is not taken to draw a little water into them at regular intervals, say once a week.

Q. How does air-pressure unseal traps?

A. Air may be compressed in a soil-pipe or unvented drain-pipe before a rapidly-advancing body of water, and force the water backward out of unventilated traps on branch waste-pipes.

Q. How can this last evil be prevented?

A. By right construction, which includes proper fall, a not too shallow water-seal, or by vent-pipes from traps, or by use of some form of trap not depending on water-seal.

Q. What is meant by the siphonage of a trap?

A. Siphonage results from the formation of a partial vacuum in that part of the soil-pipe into which a trapped waste-pipe discharges. It consists in the sucking up of so much of the contents of the cup or downward bend of an unventilated trap as to permit the passage of air or gas through it to destroy the vacuum. If the trap is of insufficient depth, enough water will not remain in it to renew the seal.

Q. How is the vacuum produced in the soil-pipe?

A. The sudden downward rush of water in a soil-pipe which is closed at the upper end will produce a partial vacuum behind it.

Q. What are the conditions under which running traps are siphoned?

A. Unventilated running traps, especially those with an easy bend or with a small depth of seal, are liable to empty themselves by the momentum of a body of water rushing through them, which, passing beyond the trap and acting as a piston, will cause a vacuum behind it and siphon the trap.

Q. How is a trap ventilated?

A. By a pipe branching upward from it at the highest point beyond the cup or downward bend, and as near it as possible, whether it be a running trap or an S trap. To be effective, the ventilating-pipe should be of liberal size, and must either open into the outer air or be arranged as a by-pass for air by connecting it with the vertical soil-pipe some distance above the trap, provided the soil-pipe is open at its upper end and carried above the roof.

Q. How does the ventilation of a trap prevent siphonage?

A. By permitting air to enter freely into the trap it prevents the formation of a vacuum.

NEW JERSEY SANITARY ASSOCIATION.

Report, With Outline of Papers and Discussions. Session of 1891.

BY D. C. ENGLISH, M.D.

The seventeenth annual meeting of the New Jersey Sanitary Association convened at the Court of Chancery room, at the State House, Trenton, at 11 A. M., Friday, December 5th. In the absence of the President, owing to illness, the meeting was called to order by Dr. English, Chairman of the Executive Council, who nominated Prof. J. Madison Watson, of Elizabeth, a former President, as chairman of the meeting. He was elected and took the chair. Dr. E. M. Hunt, Secretary of the State Board of Health, made a short address of welcome to the members, expressed his deep regret at the absence of the President, and informed the members as to hotel accommodations, &c. After the transaction of some routine business, Prof. John C. Smock, Ph.D., State Geologist, was introduced and read an interesting paper on

THE CLIMATE OF LOCALITIES IN NEW JERSEY.

He gave extracts from some old chronicles of the state of the weather in New Jersey, and then some recent climatological notes of Cape May, Atlantic City, Lakewood and Schooley's Mountain, to illustrate the broad generalizations which are made on the climates of localities. These statements are thus given without the full proof which ought to come from careful records of meteorological phenomena. Climate was said to be determined by the inter-action of atmospheric agents but not by them alone. The influence of geologic formation was noted as important, especially in a sanitary direction. Meteorology is, however, the handmaid of climate. The rapid advance in this progressive science, and the modern meteorological observations with their magnificent equipment of the instruments of precision for measuring almost continuously the phenomena of the atmosphere, give promise of great discoveries and the elucidation of general principles affecting the climate of locality. The methods of modern meteorology are applicable in New Jersey, and the knowledge to be gained is worthy of some effort to secure it. Existing meteorological records are wanting in continuity of observation in all stations where they have been kept in the State, and are, therefore, not representative, as they ought to be. Daily, or even tri-daily observations, leave gaps through which the true curves of progression are not traceable with accuracy. The topography of the State has been mapped with care, after years of expensive work in making the necessary survey. Upon this basis the climatology may be built, if the observations are made with equal care and attention to details. All of the weather phenomena are to be noted, and not periodically, but continuously. The establishment of well-equipped meteorological stations is a governmental work or that of private endowment. They are an impossibility except at a few points. It is, however, within the ability of our health resorts to maintain stations at which to observe the more common phenomena, and keep hourly or continuous records. Observations on the temperature, by means of self-recording thermometers, on the atmospheric pressure, on the hours of sunshine, and the clouds or the cloud movements, on the winds and their changes, and on rainfall, demand patient labor and painstaking care and the use of good instruments. Such data will enable us to make comparative study in the climates of localities. The importance of accurate record of climatic features in relation to the causation and propagation of disease, or to its prevention and cure, is so great that the expenditure of time and care in the accumulation of data is eminently desirable, and particularly at those localities which are said to possess noteworthy advantages of situation and of climate. What is the cause of the greater dryness of a given locality, of the beneficial effects upon consumptives at another, or what is there in the environment of another which makes it so attractive and popular a health resort? These questions ought to be answered by meteorological statistics. To explain these beneficial effects as due to some subtle agencies, which instruments fail to detect or measure, is unscientific and a backward step. The relation between known phases of the weather and certain forms of disease, and the violence of some epidemic within known territorial limits, are suggestive of cause and effect in climatic conditions. To discover them is a part of the work of the sanitarian. At the present time the records of these studies are too scanty and incomplete, and hence the urgent need of more observation. The importance of more accurate knowledge is attested by the inquiries about climates and localities, and its need by the thousands and tens of thousands of invalids who are seeking the Mecca of health among the multitude of health resorts. The publication of papers and books on the advantages of these resorts, adds little to the store of knowledge. They ought to be supplemented or replaced by more precise data of meteorological science.

Dr. Ezra M. Hunt then opened the discussion on Prof. Smock's paper. He commented on the exceeding timeliness of this paper and on the importance of a more scientific study of climate. He was glad to know that we are entering upon a new era when people are weighing the evidence presented as to the claims of health resorts, and demanding more accuracy in meteorological observations and conclusions. The desultory character of records have made them of but little value. To analyze this subject a precise method should be adopted. The health resorts should be demanded to furnish us the data upon which they base their claim. How far is the testimony of local authorities to be credited? He called attention to a paper by Prof. C. F. Brackett on the importance of precision in collecting records. (Report of N. J. State Board of Health, 1879.)

Mr. W. G. Hoopes, of Atlantic City, said he had been deeply interested in the excellent paper on this subject. He spoke of the excellent climate and healthfulness of Atlantic City, but he agreed with both speakers that the great need was more accurate observations.

TUBERCULOSIS.

The afternoon session opened with a long and exhaustive paper on "Tuberculosis, Human and Bovine," by Joseph William Stickler, M.D., of Orange, N. J.

As we might say of the papers generally read at the annual meetings, it is worthy of publication in full and of wide circulation, and it is our deep regret that the space at our disposal requires a mere outline, which fails to do it justice. Among the many points brought out by Dr. Stickler are the following:

"Tuberculosis, whether human or bovine, has, as its characteristic feature, a tubercle which has a special and definite structure, and which contains within it the specific tubercular virus, the tubercle bacillus of Koch. All the necessary conditions for the development of bacilli are, so far as their life history is known, alone to be found naturally in the animal body. The organism is of very tenacious vitality, and will preserve its virulence and capacity for development for six weeks or longer in decomposing sputum; for six months or longer in the dry state. Bacilli, whether derived from free cultivation or from tubercle, if intimately diffused in water, and scattered in the form of spray in an atmosphere in which animals are placed, so that they inhale it, will produce tuberculosis in them.

"Tuberculosis has a progressively destructive tendency, destroying not only the organ primarily attacked, but all other organs or tissues to which the bacilli are subsequently conveyed. It is clearly distinguished from various other inflammatory lesions by the development of nodules in its original seat, and also in the parts secondarily attacked.

"Some of the general causes of tuberculosis are hereditary tendency, impure air, poor food, residence in crowded towns or cities, soil and climate.

"Mothers transmit phthisis more certainly than fathers, and when but one parent is affected the mother is more apt to transmit to daughters than to sons. Air laden with dust is a factor, as I discovered when I made inquiry in regard to the physical condition of hat-finishers. Over fifty per cent. of these men die of consumption.

"The following conditions of dwelling-houses tend to the promotion of tubercular consumption:

"1. A soil either naturally damp and cold or subject to the influence of the rise and fall of a subsoil water lying within a few feet of the surface.

"2. A dwelling-house of which either the foundations, the area they inclose, or the walls are, by reason of faulty construction or otherwise, liable to dampness.

"3. Such immediate surroundings of the dwelling-house as tend to prevent the free movement of air about it, and its ample exposure to the influence of sunlight.

"4. Such structural defects as would prevent the maintenance within all parts of the dwelling-house, of ample movement of air by day and by night, and the free exposure of its habitable rooms to daylight.

"Tuberculosis is more common in the temperate than in the frigid or torrid zone. A clayey, impermeable soil, a damp, cold atmosphere and sudden changes favor the development of tuberculosis. Infection must have its place in the etiology of this disease. Among many proofs cited is that of the Fifth ward of Philadelphia, where, during the year 1888, over one-half the deaths occurred in houses in which tubercular patients had lived. The influence of age is shown as follows, the number of cases noted, 583:

From 10 to 20 years, both sexes	39 cases.
From 20 to 30 years, both sexes	307 cases.
From 30 to 40 years, both sexes	132 cases.
From 40 to 50 years, both sexes	67 cases.

"The influence of sex in 669 cases: In private practice the number of male cases, 321; of female cases, 127; in hospital practice, males, 187; females, 37. Occupation has much to do in developing tuberculosis. Clerks, tailors, factory hands, milliners and seamstresses are especially prone to it. Children improperly fed and cared for are more apt to have tuberculosis late in life than those who are well cared for. Pleurisy, bronchitis and pneumonia predispose to the disease. Cornet believes the disease is chiefly spread by dried sputum. Liebermeister supports this view and cites many cases. Rhule, C. T. Williams, Spillman, Haushatter, Hoffman, Cameron, Galtier, Steinheil, Prof. Walley are also quoted. The mortality amounts to fifteen per cent. of the whole mortality of the world at large. 'About one-fourth of all deaths occurring in the human being during adult life are due to tuberculosis, and nearly one-half of the entire population, at some time in life, acquire it.'"

Symptoms, physical signs and prognosis of acute, and chronic tubercular phthisis are then described. Dr. Stickler then proceeds to consider bovine tuberculosis, observing that the histology of tubercles as found in the bovine species does not differ, as far as he could learn, from that of tubercles found in man. The bovine tribe is pre-eminently disposed—equally so with man. Its etiology, development, symptoms and physical signs are fully discussed. As to the query whether human and bovine tuberculoses are identical he answers, that when the lower animals are inoculated with tuberculous matter from man, the results are the same as when the tubercular virus of other animals is used, and in each case the tubercle bacilli are found, and he cites Gerlach, Creighton, Orth, Bollinger, Klebs, Baumgarten and Cheveau in support of their identity, while Koch's discovery of the specific bacillus in the pearly nodules appears to remove all doubt upon this point. Proof is then offered as to the contagiousness of bovine tuberculosis:

"In the light of our present knowledge it is not necessary to ask whether human tuberculosis is communicable to the lower animals.

We know it is. The question, 'Is bovine tuberculosis communicable tó man?' may, I think, be satisfactorily answered in the affirmative. If milk from cattle with tuberculous udders be given for a lengthened period tuberculosis will be developed.

"I am of opinion that the sanitary measures of the strictest necessity are:

"1. Isolation in sanitaria or otherwise.

"2. The treatment of scrofulous patients from a tender age.

"3. The bringing up of children upon the bottle with boiled milk.

"4. The perfect disinfection of the expectoration of all tubercular patients, and of every place they have lived and expectorated in.

"5. The prevention of marriage between tuberculous subjects as far as possible.

"6. Abundance of good food and air.

"7. The obligation of creating large factories and large, airy work-houses, so that workers should not be aggregated in a small space.

"8. General comforts, such as necessary food, warm clothing, good air, moderate work, &c.

"The methods to be adopted for the prevention of the transmission of bovine tuberculosis to the human subject may be summed up in three sentences:

"1. Kill all tuberculous cattle, *i. e.* those in which the existence of the disease in their systems can be diagnosed, and destroy their carcasses and organs.

"2. Prevent the use of milk from animals in whose system it can be shown that tubercle exists, or the existence of which is even suspected.

"3. Prohibit the use (for human food) of the flesh of tuberculous animals."

Dr. Stickler's paper contained interesting letters conveying valuable information, in reply to his letters of inquiry, from Dr. Lefevre, of the Consumptive Hospital, in Villepinte, France; Dr. Dobbins, Secretary of the Hospital for Consumptives, at Brompton, England; M. Nocard, member of the French Academy of Medicine; Prof. Von Hebra, of Vienna, Austria, and others.

The discussion on this paper was ably opened by Henry R. Baldwin, M.D., of New Brunswick, substantially as follows:

"Tubercle is as old as human history. It was recognized 400 years before the Christian era, but was first described by Baillis in the year 1794, as a small, grayish, transparent nodule which was found in the lungs and in other parts of the body. Bayle, in 1810, as the result of 900 autopsies of phthisical patients, directed attention to the frequency in which these nodules were found in the phthisical lung; he believed these nodules were the expression of a general diathesis.

"Lænnec followed in the view that not only the gray miliary tubercle was the disease, but also the caseous formation (infiltration) which occurred, and these he called yellow tubercle.

"Virchow followed and denied the identity of caseous formations and the gray tubercle, claiming that caseous formations were often due to other morbid processes, inflammatory in their nature.

"Villeman developed the fact that the disease could be communicated from man to other animals by inoculation, and proved that the disease was developed whether the agent used was either the caseous formations or the gray miliary tubercle.

"Koster and Bolkman showed that the fungoid disease of joints was tubercular in character.

"Schuppel found characteristic tubercles in scrofulous lymph glands.

"Friedlander advanced the idea that lupus and tuberculosis were one and the same disease. It was found that from a single focus the infectious substance could be carried by means of the lymphatic and blood-vessels to other parts of the organism, such as intestines and the glandular structures, and Weigert gave to this infecting substance the name of tubercle virus. Finally, in 1882, Koch, as the result of his laborious research, gives us the following definition of tuberculosis:

"An infectious disease caused by the tubercle bacillus and characterized by the production of tissue and of inflammatory products, which appear both in the form of nodules and as a more diffuse infiltration, and which rapidly undergoes caseation. These bacilli are about one-eighth as long as the diameter of a blood corpuscle, and about one-tenth as broad as they are long; they are not infrequently carried, and when stained can be seen under a magnifying diameter of 700."

"These bacilli exist in great numbers in the expectoration from diseased lungs, and it is claimed that this is one of the potential factors in the spread of the disease. There are, however, several points in opening this discussion which may be presented for your consideration:

"1st. Can the bacillus tuberculosis be transmitted by heredity? This has been denied by Cornet, but the bacilli have been found in a fœtus dying *in utero*.

"2d. If not, is there a hereditary susceptibility or responsive state rendering the subjects more liable to become victims of the disease?

"3d. Does cohabitation, the absorption of the perspiration, or inhaling the breath cause the development of the disease to partners in life?

"4th. What relation does an infected animal, whether through milk furnished or through flesh eaten, bear to the spread of tuberculosis?

"5th. What are the efficient means of combating and curing the disease. Under this head may be enumerated cuspidors to receive the sputum, the use of germicides, abundance of pure air in houses, the avoidance of soil moisture, the use of such agents as will improve the general health, including iron and the carbo-hydrates.

"6th. All agencies which promote sound health, such as exercise in the open air, horseback riding, &c. The statistics of the army during the recent war show that men affected with phthisis recovered under the discipline and out-of-door life."

Dr. David Warman, of Trenton, referred to the few cases of small-pox in Trenton during the last few weeks as having created a panic, although it was easily controlled by vaccination. Not a single death from small-pox in the State was reported by the State Board of Health during the year 1890, whereas there had been 3,669 deaths reported from consumption. He asserted his belief that consumption was just as contagious as small-pox, and when contracted, was a thousand times more destructive to human life; he, therefore, contended that all cases of consumption should be isolated and all the prophylactic measures used as recommended by Dr. Stickler. He cited a case of a tuberculous child—in his own practice—who had contracted the disease from her brother by kissing him and spending much of her time in his sick-room, frequently sleeping with him, against his (Dr. W.'s) repeated remonstrances. There was no history of tuberculosis in the family. The brother had contracted the disease somewhere and gave it to his rosy-cheeked, healthy little sister of 4½ years. The brother died one week and the sister the next week, from consumption. He spoke, in closing, of the gross ignorance of the public as to the contagiousness of this disease and of the importance of enlightening them.

Dr. Franklin Gauntt, of Burlington, thought the subject one of vast importance, and that it had been treated very ably in the paper. We need to study the etiology of tuberculosis. He was convinced of its contagiousness. He thought inoculation the safeguard against all such disease.

Dr. Daniel Strock, of Camden, said he had listened with deep interest to this excellent paper. He thought that perhaps the most important point developed by the recent investigations of tuberculosis was its contagiousness. The communicability of tuberculosis from a diseased person to a healthy individual had been thoroughly established, and we now know that it is not necessary that a tuberculous person should have had a tuberculous parent or grandparent. He believed that every case of tuberculosis of the lungs was a menace to the neighborhood, due to the popular ideas concerning this disease, and the carelessness of the patient and members of the family. The time had come when physicians could do a grand sanitary work by explaining to individuals the importance of precaution in their intercourse with patients known to have tuberculosis, more especially of the lungs, and by various methods educate the public in regard to the ways in which the disease may be communicated. Parents should be taught to enjoin upon their children the importance of reserve in their intercourse with others. School hygiene should embrace regulations governing the intercourse between pupils during play. It is not a step too far in advance to say that the discipline of every school should include a penalty for the infringement of the rule forbidding kissing while upon the school premises. By these means we can hope to curtail the ravages of contagious diseases, and, in the aggregate, prolong human life.

SANITARY LEGISLATION.

The Chairman then introduced Judge William M. Lanning, of Trenton, who read a paper on "Sanitary Laws and Court Decisions in New Jersey." (This paper will be found on page 111 of this report.)

This paper should be read and studied not only by every member of a Local Board of Health, but by all who desire the sanitary improvement of our towns and cities, and to understand the powers of their Board of Health in their efforts to secure proper sanitary administration.

Judge John A. McGrath, of Jersey City, opened the discussion on Judge Lanning's paper. He referred to the excellent and thorough manner in which Judge Lanning had treated the subject; that we had but few health laws in our State; that the law of 1887 was as nearly perfect as we could probably secure. We had before that laws enough, but they were somewhat conflicting, and there were no appropriations to secure their enforcement, and that was too much the case now. The people must be led to see that appropriations are absolutely necessary. Municipal authorities need to be educated as to the importance of adequately supporting the Health Board. Harmony in health laws throughout the State is essential. We ought to have a law to compel municipalities to create Health Boards instead of the condition of things which exists in some sections, *e. g.* as is found in Hudson county, with a County Health Board, and in Jersey City a Health Board acting under a special law. He believed in this Sanitary Association—it is doing a good work, it is worthy of crowded meetings, &c.

Dr. F. Gauntt said he had been greatly interested in the paper and thought it worthy of study. He objected strongly to the discharge of the sewers of Trenton into the Delaware river, contaminating the water which is used by the towns and cities below Trenton.

Counselor William I. Lewis, of Paterson, said that while too high praise to the "Health Law" of 1887, in relation to the object for which it was passed, could not be given, yet that experience in the administration of that law, as of almost every other, suggested amendment or supplements that it might be wise to adopt. As relevant to that statement, he called attention to the fact that no provision of the law existed by which Boards of Health, in cities, could obtain additional appropriations of money in case of an epidemic of disease; that while cities had power to spend money in such emergencies, the Board of Health in such city had no control over the expenditure. Then he called attention to the fact that while by Section 14 of the law of 1887 the Local Boards were enabled to abate a nuisance existing on property and to recover from the owner the expense incurred, yet that where the owner was a non-resident, in which cases recalcitrancy is most often found, the fact that the recovery of the amount must, according to the form of the statute, be by action of debt, precludes recovery by the Board, but that an amendment to the act, allowing a recovery by attachment, would give ample remedy in such a case.

Judge McGrath, of Jersey City, asked Judge Lanning, "Why are we troubled in Jersey City with the pollution of our water-supply? Suppose Newark or Jersey City should enforce existing laws would the pollution of the Passaic be stopped?" Judge W. M. Lanning replied substantially as follows:

"That is a hard question to answer. The Newark Aqueduct Board recently sought to obtain what we call a preliminary injunction against the city of Passaic to restrain that city from polluting the waters of the Passaic river, from which the water-supply of Newark is obtained, and the injunction was refused. I can only suggest that there might possibly be a different result in case the Newark Local Board of Health should, by its sanitary code, under the power granted to it by the law of 1887, provide for the protection of her water-supply and prohibit the pollution of the Passaic, and should they then apply to the Court of Chancery for an injunction to restrain the pollution of that. In all the cases that have been brought before our Court of Chancery by Local Boards of Health the application for injunction has been based upon the general provisions of the act of 1887, and not upon any specific provisions of local sanitary codes for the protection of the public health. As stated in the paper which I have had the honor to read before the Association, the act of 1887 is an exercise of the police power of the State, and is intended to authorize Local Boards to prevent what may be injurious to the public health as well as to detect and punish. The language of the law is that Local Boards of Health may pass ordinances 'to protect the public water-supply and prevent the pollution of any stream of water, the water of which is used for domestic purposes.'

"It seems to me that a Local Board of Health is authorized by this language to prohibit any pollution of a stream which endangers the public health, for, otherwise, how can a Local Board 'protect the public water-supply?' I would, therefore, suggest that the legal advisers of the Local Boards of Health of Newark and Jersey City should consider whether it would not be wise to prohibit, by code, in clear and unmistakable language, the pollution, by any person or persons, or private, public or municipal corporations, of any stream from which those cities draw their water-supply, and then to base their application for an injunction especially upon such provisions of their sanitary codes.

"A code containing a prohibition against throwing a dead animal into a city's reservoir of water, even though that reservoir were outside of the city's limits would undoubtedly be deemed a reasonable prohibition. Whether a prohibition in the sanitary code of Newark against conveying into the Passaic river, above the point from which Newark draws her water-supply, the sewage of any city or town, would be deemed reasonable, is a question involving so many important legal rights and principles that I forbear to express an opinion on it. By adopting the suggestion I have made, I think, however, that either Newark or Jersey City may get its case before the Court of Chancery in a better manner than by acting through any other local authority."

MICRO-ORGANISMS OF THE SCHOOL-ROOM.

The evening session was presided over by Prof. Watson and began with prayer by Rev. Dr. John Dixon, pastor of the First Presbyterian Church, Trenton. Rev. Samuel Lockwood, Ph.D., of Frehold, was then introduced and read a most excellent paper on "The Micro-Organisms of the School-Room," and afterwards exhibited a very ingenious apparatus, made by himself, for the purpose of securing accuracy in his observation in the study of the subject. He also showed several specimens of organic matter which had been gathered from the dust floating in the atmosphere of school-rooms, and explained his methods of securing and depositing it in tubes.

(Prof. Lockwood's paper will be found on page 85 of this State Board of Health Report.)

Dr. H. G. Wetherill, of Trenton, opened a discussion on Prof. Lockwood's paper. He said the paper covered the ground very fully, and he had but little to add after such a valuable presentation of the subject. He spoke of the almost invariably vitiated air of school-rooms. The micro-organisms of the school-room which interest us most, he said, are those which may be a factor in producing or disseminating disease. They may be of a kind generated in sewers, or foul or damp cellars, or of a kind which convey disease from person to person. The consideration of this question he believed was inseparably connected to the consideration of cleanliness and ventilation and leads directly up to the dust problem. Dust is a common carrier of micro-organisms, and is no mean factor as a disease producer aside from its being so freighted (witness, he said the asthma and consumption of potters and flour-millers), but the dust of the school-room carries to each child an assortment of schizomycetes, more or less dangerous. Dr. Richard Stern concluded after careful experimenting—(1) That micro-organisms rapidly sink to the floor in quiet air. (2) The usual ventilation effecting a removal of air from one to three times an hour, has effect upon the removal of micro-organisms with summer ventilation, and only to a limited extent with winter ventilation. (3) Ventilation effecting a more rapid change of air (six or seven times an hour), affects the removal of micro-organisms but slightly, without a sensible draught. (4) A rapid and complete removal of the micro-organisms from the air is only obtainable by a strong draught. (5) Micro-organisms are not blown off the floor, wall, furniture, clothing, &c., even with a stronger draught. (6) The evolution of steam in a room is not capable of rapidly and completely precipitating the micro-organisms, although it hastens this process to an appreciable extent.

Dr. Wetherill then asked:

May we not thoroughly conclude, then, that the best means to avoid danger from the micro-organisms of the school-room are cleanliness of person, of room, and above all, having an atmosphere free from dust? Ventilation is shown not to make any greater circulation of micro-organisms, and should be encouraged. The transmission of contagious diseases, and the susceptibility to filth diseases are simply questions of seed and soil. He said he was on one point only compelled to differ with Dr. Lockwood, and that was his statement that the child was not as susceptible to disease as were older persons. He considered that children were particularly susceptible to disease. In young children we have the most fertile material for a pathogenic organism to grow and multiply in that the human family affords, and we must throw out every safeguard that will keep the seed from the soil. We are not so apt now to say of a child that he inherits consumption, as to explain that his family have consumption, and we must guard this susceptible one from exposure to the disease. Rigid quarantine of contagious disease, prohibiting spitting on the floor, and the prevention of flying dust, together with the maintenance of good sanitary conditions in and about the buildings, he believed would do much to keep out the most dangerous of the micro-organisms of the school-room.

MENTAL HYGIENE.

The Chairman of the Executive Council then took the chair. He spoke of the pleasure it gave the members to see so many of our ex-Presidents in attendance during the day, and he has the pleasure of introducing one of them, who had been called to preside over to-day's sessions—Prof. J. Madison Watson, of Elizabeth—who made a short address on "Mental Hygiene." (See notes on Mental Hygiene, page 103 of this report.)

Prof. A. B. Poland, Superintendent of Public Instruction of Jersey City, was then introduced and opened the discussion. (See notes on Mental Hygiene, page 104 of this report.)

PHYSICAL TRAINING.

Prof. Charles H. Raymond, Ph.D., of Lawrenceville, was then introduced and read a paper on "Methods and Results of Physical Training."

(This paper will be found on page 91 of this State Board of Health Report, and is worthy of careful perusal and study.)

On Saturday morning the session began at 9:30 o'clock, ex-President George P. Olcott, C.E., of East Orange, in the chair.

On motion, the rules were suspended and miscellaneous business was taken up.

Dr. John L. Leal reported from the committee the following nominations:

President—E. L. B. Godfrey, M.D., Camden.
First Vice President—C. Phillips Bassett, C.E., Newark.
Second Vice President—Prof. A. B. Poland, Jersey City.
Recording Secretary—Shippen Wallace, Ph.D., Burlington.
Corresponding Secretary—Prof. J. Madison Watson, Elizabeth.
Treasurer—George W. Howell, C.E., Morristown.

EXECUTIVE COUNCIL.

(With the above named officers.)

D. C. English, M D., *Chairman*, New Brunswick.
Prof. Charles H. Raymond, Ph.D., Lawrenceville.
Judge William M. Lanning, Trenton.
Rev. Samuel Lockwood, Ph.D., Freehold.
Prof. H. B. Cornwall, Ph.D., Princeton,
Judge J. A. McGrath, Jersey City.
Prof. J. C. Smock, Ph.D., State Geologist, Trenton.
William Pierson, M.D., Orange.
Prof. Charles M. Davis, Bayonne City.
Henry R. Baldwin, M.D., New Brunswick.
Daniel Strock, M.D., Camden.
James Owen, C.E., Montclair.
W. G. Hoopes, Architect, Atlantic City.
John L. Leal, M.D., Paterson.
J. H. Platt, M.D., Lakewood.
Dr. Nicholas Murray Butler, Paterson.
Prof. W. N. Barringer, Newark.
J. R. C. Thompson, M.D , Bridgeton,
David Harvey, Counselor, Asbury Park.
H. G. Wetherill, M.D., Trenton.
J. R. Chambers, M.D., East Orange.
Edw. S. Atwater, Counselor, Elizabeth.
Joseph H. Powell, Esq., Bridgeton.
Richard H. Reeve, Esq., Camden.
George W. Rockfellow, Esq., Plainfield.
Herbert B. Baldwin, Chemist, Newark.
A. Clark Hunt, M.D., Metuchen.

The report was accepted, and no other nominations being made the officers nominated were unanimously elected.

Dr. J. L. Leal offered the following resolution, which was unanimously adopted:

"*Resolved*, That the Chairman of the Executive Council be directed to prepare proper credentials and have them signed by the President and Secretary of this Association, and issue said credentials to any members of this Association who may wish to represent the New Jersey Sanitary Association at the meeting of the American Public Health Association, next year, in the City of Mexico."

George P. Olcott, C.E., on behalf of the owners and managers of the "Laurel House," Lakewood, invited the Association to meet next year at the "Laurel House," Lakewood. The invitation was by a unanimous vote accepted, and a Committee of Arrangements was appointed, consisting of Geo. P. Olcott, C.E., J. H. Platt, M.D., and W. J. Harrison, Esq.

On motion, the paper on "Water-Supply in Northern New Jersey" was laid over till the next annual meeting.

TRAPS AND VENTS.

On motion, the paper on "Traps," laid over from last year's meeting, was presented by Dr. E. M. Hunt, Secretary of the State Board of Health. (For this paper see this State Board of Health Report, page 123.)

E. L. B. Godfrey, M.D., of Camden, President-elect, appeared and took the chair. He introduced George P. Olcott, C.E., who opened the discussion on Dr. E. M. Hunt's paper.

Dr. E. S. McClellan, of Paterson, called attention to the two main points upon which opinions differ on the subject of traps and trap-seal protection; first, as to the disconnecting trap at the cellar wall, and, second, as to the question of preserving the seal of the trap immediately connecting the fixture with the drainage system. He believed the trap at the cellar wall serves no useful purpose, because the air of the common sewer is more diluted and less dangerous to health than the air in the pipes on the house side of the trap. It obstructs the free discharge of sewage and establishes a cesspool which serves as a nidus for the development of disease germs, and its fresh-air inlet, when operative, serves to conduct the foul air and disease germs to the street curb, whenever the house pipes are flushed by the discharge of a fixture. It complicates the plumbing, and adds from twenty-five to fifty dollars of needless cost to the plumbing of a house, besides giving to the occupant a false sense of security; but the maintenance of a trap-seal against all disturbing causes is a most vital point to be secured. Such a construction as can be relied upon under all possible conditions arising in plumbing practice should be employed, and none other should be tolerated. All sanitary authorities, he believed, agreed that a simple bent pipe, resembling the letter S, forms the best possible trap ever yet devised, provided its seal can be preserved; but the readiness with which siphonage occurs in such a trap, if not provided against, has led to the production of all manner of so-called anti-siphon traps.

Dr. McClellan called attention to the extended series of experiments on trap-siphonage conducted in the department of tests at the Stevens Institute of Technology, in order to determine with accuracy the comparative merits of the various means resorted to in plumbing practice to preserve the trap-seal; that it was there shown that all unvented traps, of whatever name or form (so-called anti-siphon traps), are liable to have their seals destroyed by siphonage under conditions frequently occurring in ordinary plumbing practice; and that the instantaneous admission of an adequate amount of air at the crown of the trap is the only absolutely reliable means of preventing siphonage. This supply of air is sought to be secured by extending lines of pipe from the crown of each trap to a point above the house-top, but it is attended with many complications and great cost, and is subject to many contingencies that give rise to frequent failures, such as the rapid destruction of the pipes by corrosion, the choking of angles in the pipes by rust, debris, the closing of their tops by frost and the frictional resistance of the contained air in long and angular lines. In addition to these defects, it was also demonstrated that in certain situations, common and unavoidable in plumbing practice, the orthodox vent-pipe, owing to back pressure, directly contributed to the total destruction of the trap-seal. Thus he argued that neither the so-called anti-siphon traps nor the recognized system of trap-venting by lines of pipe can be relied upon with certainty as a means of trap-seal protection, and that the only other alternative is a resort to the automatic method of venting. Objection, however, has been raised to this, because the result is secured by a mechanical device, but he thought this objection was infinitely less than those found to exist in the method described. He closed by referring to the device offered by himself to the public about six years ago as having demonstrated not only the feasibility but the great superiority of the automatic method of venting sewer-gas traps for the protection of the trap-seal over all other known means.

James Owen, C.E., of Montclair, spoke in substance as follows:

About fifteen years ago considerable attention was called to the improvement of the trapping of plumbers rendered necessary by the agitation of the question of sewer-gas. The system of trapping then considered proper was to put a trap in the main sewer, with a vent-pipe outside the house, a vent-pipe inside the house, with a fresh-air intake, improved traps at each connection in the house, with a ventilating-pipe from each trap to prevent siphonage. With these precautions generally adopted the question of sewer-gas has practically disappeared as an ordinary experience and is only considered an exceptional occurrence.

A reaction, however, seems to have set in, and the discarding of three of the standard precautions is now openly advocated, viz., the trap in the main, the outside vent-pipe and the ventilating-pipe to each trap, leaving only the trap as now improved as the one and only safeguard in a house. He begs leave to differ with Dr. McClellan, that the air in the street-sewer is purer than the air in the soil-pipes of the house. Only under very exceptional conditions is there anything but fresh fæcal matter in the house-pipes, and it is well known that such matter is comparatively innocuous. Now, when it is proposed to carry the air, supersaturated with the noxious gases from the sewer, through the house, with the hope of oxidizing the gases in the soil-pipes of the house, the idea seems fatuous, and, in addition, when we consider the number of days in the year when the air-currents are liable to prevent free circulation in the house-pipes, and also the risk from unused wash-basins in the houses affording an unobstructed current for the gases into the house, it seemed to him that the advocacy of the abolition of well-considered methods and practices in plumbing is opened to strong criticism, to say the least.

Mr. Julius Coty, plumber, of Atlantic City, spoke substantially as follows:

"I am very much interested in this discussion, and I would like to add a few remarks to what has already been said in regard to trapping the main drain at the house or property line. So far as my experience goes I am not in favor of it, and I believe, as the gentleman who just spoke says, that it is a useless expense, for which there is no commensurate return, and in some cases it is a positive evil; as, for instance, in the city of Atlantic City, where our system of sewerage is such as requires comparatively small pipes for main sewers, and there are no air-currents, the pipes running nearly or quite full. In this case the house trap serves merely as an interruption of solids, which should find their way to sewer; this in time obstructs the trap and drain, and often causes the overflow of fixtures, with serious attendant consequences. With a straight, unobstructed house drain this would not happen, and by properly regulating the size of soil and vent-pipes, a complete safeguard from back pressure is provided for.

"The discussion seems to be tending towards what particular or peculiar kinds of traps are best. My experience is, that nearly all traps are good or bad, according as to the manner or position in which they are placed. For instance, we will take the "Cudell Trap" as a type of mechanical trap. Place this close to a fixture as possible, and you have catch-basins and trap combined, which soon fills up, because the force of the water is not sufficient to scour out any sediment which may lodge in the body of the trap. Place this same trap twelve or eighteen inches below the fixture and you change the conditions. The impetus of the water gained by the additional fall, will thoroughly clean the trap. It seems to me that the question should be, not as to any particular trap or traps, but rather as to the best manner and methods of using them. Again, we will take an ordinary S trap, place this under the same conditions as the other, and you get directly opposite results; from its construction, the currents are continuous towards the outlet. It is evident, therefore, that this trap will offer less resistance than the other. Now, if placed twelve or eighteen inches below the fixture, the same momentum that cleans the Cuddell trap will, by the velocity attained, almost, if not quite, exhaust the seal, and this under conditions which the trap vent is powerless to prevent. I also believe that architects are, in a measure, responsible for a great deal of the badly-constructed plumbing we often see; of course, I do not mean to infer that it is intentionally so, for as a class they take great pride in their work, but, for example, Mr. Architect will start out and specify minutely all fixtures, baths, basins, sinks, &c., the size of drain, weight of pipe per foot, how joints shall be made, pipes to be run straight, &c., all fixtures to be trapped separately, and the trap set as close to the fixture as possible, and then at the end tack on a clause that all traps shall be 'Cuddell,' or perhaps some other traps of the same general pattern. The plumber, if he is an ordinary man, will be at a loss which to do; his experience tells him the trap would be better lower down, but the architect says up, so the plumber prefers to let the architect shoulder the responsibility, who consoles himself with the thought that it must be right, because authority says so, *i. e.* 'that it is best to place traps close to fixture as possible.' This is one of the many mistakes that are made, and which would not occur if an intelligent and practical plumber were consulted. It is a common saying among the building craft, that it is much easier to build a house on paper than with solid material, and this is especially so of plumbing.

"The art of plumbing has been rapidly advancing during the last decade, and at the present has become almost a science—a science which is constantly advancing and calling to its aid the medical, scientific and practical minds of the country, and this Sanitary Association is a grand step in the right direction, as tending to unite scientific theory and practice in their search of the best means and methods for protecting the health of our people. All practical plumbers, as well as professional men and engineers, should belong to this body, and lend their aid to educate the plumbers as to the best systems to adopt, rather than what styles of traps and vents to put in—a knowledge of the condition under which each trap will work, rather than which is the best trap."

Dr. E. M. Hunt, in concluding the discussion, said that the object of his paper had been to present the accepted method of applying traps and of avoiding siphonage. The chief discussion had been over the outside trap. He did not believe that this could always be dispensed with, although with a manhole or vent-pipe outside where the sewer-pipe leaves the building there were cases in which the use of this trap was not imperative.

PREVENTION OF EPIDEMICS.

Dr. E. M. Hunt then read an able paper on "What is to be Done with *Schools* when Communicable Diseases Occur in Them?" (For *this paper*, see Circular 77 of the State Board of Health.)

DISPOSAL OF GARBAGE.

Ex-President Alcott then took the chair and introduced Dr. E. L. B. Godfrey, of Camden, who made an able address on "The Removal and Disposal of Garbage," as follows:

"I believe you will agree with me when I state that the disposal of garbage is one of the most important, if not the most difficult problem that Local Boards of Health have to deal with. It is a problen that has grown, *pari passu*, with the growth of cities. This being admitted, two propositions present themselves—first, that the overruling thought in all ordinances relating to the removal and disposal of garbage should be a regard for the interests of health; second, that as cities grow, the need of cleanliness increases and the more stringently should health ordinances be enforced. Having presented these underlying propositions, I beg briefly to consider what seem to me to be the leading points relating to the collection, the removal and the disposal of garbage.

"As to the collection of garbage, it seems necessary, in order to obtain the best effects, that laws regulating the collection should be addressed with equal foree and clearness to the housekeeper and the garbage collector. Housekeepers should be required to keep dry refuse, like the peelings of vegetables, apart from ashes and liquid refuse of any kind. Indeed, there is no excuse for a wet slop-can when there is underdrainage. They should be obliged to provide proper receptacles for both dry and moist refuse, and place them upon the sidewalk at specified hours. For moist animal and vegetable substances, vessels of galvanized iron with proper covers and large enough to hold the accumulations of two or three days, will be found to be the best and most serviceable. Cleanliness of the receptacles should be insisted upon.

"The collectors of garbage should be required to collect from certain streets at stated hours, and have the power, as is the case in Boston and other cities, to enter the yard if necessary for the collection.

"As to the collection of garbage there are two systems, both of which find favor in different cities, *i. e.* the contract system, and the system of collection under the direct supervision of a department of city government.

"The contract system is usually objectionable, especially in large cities, where the requirements of health are greater than financial considerations. Under the contract system there is not that direct responsibility that should be required. The collector is not responsible, as a rule, to any single official, but generally to a committee, where division of interests leads to lax discipline. The contractor is more apt to look to his financial interests than to the health of the city; neither does he provide, as a rule, for the transportation of garbage, the best implements in use. It seems best, therefore, if collection of garbage is conducted for the maintenance of health, that the collection should be done under a special department of city government, where the collector is directly responsible to and under the supervision of an official of that department. Then regular collections will be made and garbage removed while in a fresh state, before decomposition occurs, which is a material point; the admixture with ashes and other dry refuse, which greatly complicates both the collection and disposal, can be prevented; reports of neglect of collection can be quickly investigated; leakage along the street remedied; bad odors disinfected; housekeepers held to a strict accountability, and the Supervisor himself will know where all garbage is dumped, which is by no means an insignificant point. In addition to this, the removal of garbage will be more satisfactorily carried out under the supervision of a city department, because an ample appropriation will then admit of the use of the proper implements for transportation. These should consist of water-tight carts, lined with a non-absorbent material and having air-tight covers, thus preventing leakage along the street and bad odors; or water-tight barrels, with proper linings and coverings, and of the size to admit of easy handling, which may be left at large establishments, like hotels, and removed upon trucks when filled.

"The proper disposal of garbage is a problem of difficult solution. Dumping it upon open spaces within city limits is so reprehensible that it does not admit of discussion. Dumping-places should be outside of city limits and located at a point where they will give the least disturbance, for they are sure to cause, in a greater or less degree, contaminations of the air, water and the soil. In the same place garbage is separated, picked over at specially-built dumping-places and sold to farmers as food for swine and cows. By this method of disposal it is claimed in one of the larger cities that enough money is realized to pay for the cost of collection and transportation. But the method cannot be other than objectionable, because the selling of any food that has or is about undergoing decomposition is objectionable.

"Removal to sea, in boats built for the purpose, is employed as a method of disposal in a few of the sea-coast cities, but the method has met with decided opposition from the smaller towns along the coast, especially in our State, on account of the garbage drifting upon the shore.

"By far the best method for disposing of garbage is burning, although this has not been accomplished with entire success in many of the cities that have adopted the method. In some of the larger cities abroad, it is claimed that garbage is successfully burned, and that all disagreeable gases arising from the burning are consumed. It has been practiced in a number of our larger cities, but not with unvarying success. With proper plant, however, it cannot be doubted but that the disagreeable odors incident to burning of garbage will be overcome, and the practice adopted on an extensive scale, since this seems to be, when properly carried out, the best method for its disposal.

"Another method that is now practiced consists of drying garbage, extracting the oil products, and disposing of the residue as fertilizers."

Dr. E. M. Hunt thought the address had well covered the points to be considered as to garbage disposal.

Jacob S. Wetmore, Esq., of Englewood, expressed his pleasure in listening to and approving the paper. His attention had been called to an inexpensive system of burning garbage at Coney Island; the plant, he had been informed, cost about $5,000, and it was said that there had been no complaint of it as a nuisance. He spoke of the great and increasing importance of this subject.

Dr. J. L. Leal, of Paterson, reviewed the chief garbage destructors, as the Engle, the Rider, the Metz, &c., and doubted whether any of them had been entirely successful.

George P. Olcott, C.E., spoke of the difficulties attending a satisfactory method of disposing of garbage, but he thought that if it was possible to induce care on the part of the householders and servants, it would be far less difficult. In reference to sewage he said he believed that East Orange, after it had spent about $60,000 for its experience, had a system which answered the purpose better than any other he knew of, where the sewage is received into tanks, the solids are separated from the liquids, and the solid sludge is pressed into cakes. The odors are very slight. The question of the disposal of the sludge was somewhat difficult, but it was being burned in a furnace with smokestack running forty feet high, rendering the odors unobjectionable.

He said that Col. Waring, on investigating these disposal works recently, expressed himself as agreeably disappointed at the degree of success which these works promised.

Mr. Wetmore strongly questioned whether sewage disposal into running streams should be allowed.

Dr. E. M. Hunt said it was very generally believed to be objectionable and should not be permitted. He thought precipitation, by chemical methods, was valuable in purifying effluents.

The President, Dr. E. L. B. Godfrey, appointed as the Committee on Legislation the following:

L. B. Ward, C.E., Jersey City; William I. Lewis, Paterson; Judge J. A. McGrath, Jersey City; Judge W. M. Lanning, Trenton; John S. Westcott, Atlantic City.

THE PRESENT TESTIMONY OF SCIENCE AS TO ALCOHOL.

BY EZRA M. HUNT, M.D.

By alcohol we mean ethylic or common alcohol. It is necessary to specify this, as there are several alcohols. Some, like methylated spirits, are added in the falsification of liquors. Amylic alcohol, variously known as grain oil, fusil oil, &c., is very frequent in ethylic or common alcohol, because it is made in the usual manufacture of spirits from corn, potatoes or the mash of grapes, and it is very difficult to separate it completely from the ethyl alcohol. Alcohol has long had its place among poisons, and the present testimony of science keeps it there. It is a toxic, and it intoxicates now as always. It is not the minute dose but the full dose of an article that tests its physiological effects. Because a minute dose does no declarative harm, it is not thereby removed from the poison category any more than are opium, belladonna, strychnine or arsenic, because moderate doses are used as medicines.

We now ask definitely, What is the most recent testimony of science as to the use of alcohol as a food?

In order to determine this we properly inquire, What constitutes a food? The answer still stands that "the food employed for nourishment of the body must have the same or nearly the same chemical composition as the body itself. Our bodies and our foods consist of essentially the same materials."

This is found to be the case not only with animal food but vegetable albumen. Fibrin and caseine are scarcely to be distinguished from the bodies of the same name extracted from blood and milk. These are variously called the nitrogenous, albuminoid, cell-forming or *protein* compounds constituting the "plastic elements of nutrition," which afford nutrition by "tissue-building," whether for growth or repair. These include the modern division of albuminoids, gelatinoids and extractives, all of which contain nitrogen.

The answer also stands that the other division of foods is that of respiratory or force and heat-producing foods, in which the starches, fats and sugars produce a heat or vital force, which is to a great extent the measure of the comparative value of such foods. These "keep up the temperature of the body by the combustion going on between them and their products and the oxygen of the air in the blood." These are variously called hydrocarbons or carbonaceous aliments, as gums, starch, sugar and fats. If we examine these we can trace and estimate the processes by which they evolve heat and are changed into vital force, and can determine the capacities of various foods. We find with both of these classes of foods certain definite salts which make up the one other class of foods. Water serves as a dissolving or distributing menstruum by which interchange in the system and riddance of effete substances are secured. We are aware that chemists and physiologists do not separate these two classes of foods by so hard and fast lines as did Liebig and his followers. But to show how fully the general principles of the divisions are maintained, although modified, and how even more accurately than formerly we are able to define and classify foods, we need only to refer to such recent statements as those from Prof. W. O. Atwater, who has given to the subject of food experiment and food values such skilled investigation:

> "The protein compounds, sometimes called muscle-formers, are the only ones that contain nitrogen. According to the best experimental evidence, they alone form the basis of blood, muscle, tendon and other nitrogenous tissues of the body. As these tissues are worn out by constant use they are repaired by the protein of the food." (See article on the "Chemistry of Foods and Nutrition," W. O. Atwater, Vol. XXXIV., page 73, 1887, of "The Century.")

The fats of food are stored in the body to produce heat. Fats are consumed for fuel, *i. e.* to keep it warm and provide muscular energy for the work it has to do.

The carbohydrates are changed into fat; are consumed for fuel. The modification is that, in addition to these distinct effects of these foods, the protein of foods, besides being, alone, the basis of blood, muscles, tendons and other nitrogenous tissues of the body, is also available for change into fats and hydrocarbons, and for fuel. Yet it has but little of that which is called "potential energy." (See series of articles above referred to.) While the protein or nitrogenous compounds are thus available, "to a degree the carbohydrates and fats cannot replace the protein."

So far as we know, no one, by the light of more recent science, pretends to claim that alcohol is a source of protein. It has no nitrogen, and cannot do any of the work of nitrogenous foods. If, therefore, it is to be searched for as a food we are to look for its power as a producer of fat or of hydrocarbons, or as, in some other way, furnishing fuel. The fuel value of a food is what is called its "potential energy."

Some time ago Professor Frankland, of London, determined the heats of combustion of different food materials by measuring the heat generated in the consumption of various foods in a calorimeter, and stating this as their fuel value, or potential energy. Our latest scientific researches have shown that the heat thus generated in the calorimeter is "an accurate measure of the energy developed by the same materials in the body." This energy is the result of a process of combustion by union with oxygen, as when fuel is burned in a fire. Heat, as produced in the animal, is only known as a result of the process of combustion. We can measure thus the energy developed by the comsumption or combustion of these foods.

It was formerly supposed that the ingestion of alcohol increased bodily heat and temperature, and so it was concluded that it acted just as others of the force or energy-producing foods do, when by entering into combination with oxygen there result carbonic acid and water with the production of heat.

But now the experiments of Prout, of England, Bocker, of Germany, as followed by the evidence of Anstie, Richardson, Brunton, Atwater, Hammond, Davis and others, show that "alcohol does not form tissue, flesh or fat and apparently has no effect as a fuel." The testimony of modern experiment is uniform in showing that alcohol "diminishes temperature and is a sedative and paralyzer rather than a stimulant."

As a result, medical practice now recognizes it as one of the medicaments for reducing temperature. No one has yet explained in what way a fuel or heat or force food can do this. But why it does this is not so difficult to explain. It is because its action is neither that of a food nor in any true sense a stimulant. Dr. Sidney Ringer, in a report made in 1883, as a result of experiments on the action of alcohols upon the heart, records the effect as "clearly paralyzant, and that this appears to be the case from the outset, no stage of increased force of contraction preceding."

It now finds its place in the materia medica as a "cerebral sedative," to which class belong narcotics and anæsthetics, the effects being chiefly expended on the nervous system. These diminish and suspend the functions of the cerebrum after a preliminary stage of excitement. Bartholow puts under the same head opium, chloroform, chloral and the bromides.

More recently, Professor Martin, of Johns Hopkins Uuniversity, fully confirms these views. Its effect on the circulation is chiefly due to its effect on the cardiac and vaso-motor nerves which are distributed to the blood-vessels, and is that of an anæsthetic or sedative. It diminishes sensibility and often does so to actual paralysis.

Thus the whole direction of evidence, both of recent chemistry and recent physiology, is to deny any place to alcohol among the food products. As never before, modern chemical investigation, with its greater perfection of methods, fails to find it either amid constructive, reparative or energy-producing foods.

Hence, the last few years have been fertile in hypotheses by those who have from immemorial custom looked upon it as a stimulant and force-producer and who seek to find evidence that it originates or conserves force. These arrange themselves at present under two heads:

The first speak of it as among the food adjuncts, accessory foods or possible foods. Professor Atwater, as to these, quotes from Professor Forster, a well-known experimenter, in speaking of what the Germans call "'genuss-mittel'—appetizers is perhaps our nearest corresponding word." He shows by actual experiment that these have been overestimated as helps to digestion. He then refers to alcohol as one of these appetizers or food adjuncts, claimed to aid digestion, and says of all of these, "the quantities digested appear to be less affected by flavor, flavoring materials and food adjuncts than is commonly supposed."

The next contention has been that although alcohol does not respond to the usual definition of foods, it is an accessory in that it retards "regressive metamorphosis and so adds to the physical force." Now, all chemists and physiologists are familiar with the metamorphosis which takes place under the general name metabolism. Life itself is a process of daily income and expenditure, the income being the food that is digested and appropriated. Some of this is used for the construction of new tissue, some for force and repair. The outgo is in the form of carbonic acid and water by the lungs, kidneys and skin, or in that of urea and allied products that escape by the kidneys. This appropriation of foods by the system, the combinations made with used-up material and its removal, constitute the uniform and indispensable phenomena of life. The contention of those who claim alcohol is acting the part of an accessory food, is that somehow it delays metabolism and causes what has been called a "retrograde" or "regressive" metamorphosis and so husbands the resources of the system. This is equivalent to saying that it interferes with the natural process by which life is conserved. The advocates of this view are singularly deficient in facts needing to be furnished by chemistry or physiology, but rely upon what they call the experience of practitioners of medicine.

Now, the physiological conclusion as to any substance which did actually interfere with the natural phenomena of disintegration and of life, would be that it would prove an embarrassment to health and promote those various degenerations which are so characteristic of the effects we see in chronic alcoholism. After careful search we have been unable to find any chemical or physiological facts which warrant the assumption that alcohol fortifies life by any such process.

It is not suspension of life processes that we want in any such emergency, but rather the most skilled use of the most available tonics, and the avoidance of excessive wastage by not calling upon the body to perform its usual service. Dr. B. W. Richardson, of London, so eminent as a physiologist and as a medical practitioner, in a recent note to me, in answer to an inquiry as to the effect of alcohol in this respect, says, "I have no reason to believe in delay of metamorphosis, or if there be such, I should consider it injurious." He adds, "I think in this country the appreciation of alcohol and its defense by leading practitioners, in regard to food value, has much decreased." We are aware that Dr. Binz, of Bonn, perhaps the ablest advocate for the medicinal use of alcohol, claims that it is an "economic factor." But it is worthy of note that he only speaks of it as "available on the sick-bed," and more than intimates that its use in any healthy subject is an abuse. If it is an "economic factor" in any food sense, it could only be so by being consumed in the organism. If so consumed it should respond to the tests of other foods, which it does not. We know of no new light from physiology or chemistry on this hypothesis of delayed metabolism since we fully examined it in the little treatise on "Alcohol as a Food and Medicine," 1876, and so refer to the arguments and facts there contained. (Pages 49–56.) We are not aware that any one has brought out any chemical facts, or any facts, as to the physiological process of digestion, that at all substantiate this view. Indeed, most of those who propound such a view are fair enough to offer it only as a plausible explanation. Thus, Hammond, in his plea for regressive metamorphosis, says, "It is not at all improbable that alcohol furnishes the force directly by entering into combination with the products of tissue decay, when they are again formed into tissue without being excreted as urea, uric acid, &c."

Prof. Bartholow, who also refers to delayed metamorphosis of tissue as a probable use of alcohol, sees the chemical and physiological dilemma, and so, without the needed explanation, adds the ominous sentence, "As alcohol checks tissue metamorphosis, and thus diminishes the evolution of heat and force, it might be expected that the products of its own oxidation would supply the deficiency, but this is not the case." If such is not the case, why not? How does alcohol do this strange work of arresting tissue metamorphosis and so conserving health, without the usual relation to oxygen?

We have a recent opinion (March, 1891) from Prof. A. B. Prescott, of the University of Michigan, who has perhaps studied the alcohol series with more thoroughness than any chemist in this country. He says, "In my decided judgment alcohol is not a food. To lessen tissue metamorphosis is not to serve as a food, but is more commonly to antagonize the service of food. If alcohol had no other action than to suffer oxidation it would be a food. But the chief action of alcohol is always that of a neurotic. Its total action is to lessen the total of oxidation in the system. So its service is not that of a food, but that of a neurotic." The fact is, that since we have come to know through physiological chemistry more definitely what chemists understand by "metabolism," the phrase "regressive metamorphosis," or "delayed metamorphosis of tissue," is retired from service. If any argument is to be made on that basis it must now be called arrest of or interference with vital metabolism, and so chemistry and physiology are rightly called upon to furnish the facts and experiments illustrating this process. This is something that no one has yet done.

The trend of scientific research, therefore, up to the present moment, is more and more against assigning any definite food value, direct or incidental, to alcohol. We know neither the calorimeter nor chemical laboratory nor physiological experiment that shows any such a result.

We are not disposed, in this discussion, to minimize the import of any facts as to alcohol in its relation to man, or even to discard testimony which claims the basis of experience, even though it has no scientific facts to confirm its findings.

We will not even press the criticism that so many physicians have become prejudiced through the force of habit or through their own moderate indulgence in table appetizers, although many of them are not slow to insinuate that medical temperance testimony is prejudiced because of abstinence.

We, therefore, next inquire what is the present testimony as to alcohol, of those who study it as clinicians and who consider it with reference to its actual effect in disease.

Our reply to this is that the result of the last fifteen years has been greatly to constrict the sphere of alcohol as a medicine, but, nevertheless, to insist upon its value and availability in the class of cases to which it is adapted.

Just here we beg to say that, in our judgment, some advocates of total abstinence have felt themselves called upon to dispute the possible value of alcohol as a medicine to a degree not at all necessary to sustain the doctrine of total abstinence.

The claim that the value of alcohol as a medicine depends upon its availability as a food would need to be dealt with, because arguments as to that might, by implication, refer also to a state of health. But it is all gratuitous to assume that, because to a restricted degree alcohol may be used as a medicine, its value depends upon any such principle.

We accept ethers, aldehyde and other products allied to alcohol, as well as digitaline, morphine, strychnine, quinine, &c., as having medicinal value, without any insistance upon indirect food value, and, indeed, have often to accept substances as of apparent medicinal value when we do not know the "modus operandi," and which we know to be inimical in health. We at once grant that there are states in which small doses of opium, of strychnine, of quinine and many other substances, when skillfully prescribed, help invalid life over some of its hard places.

So there can be no doubt that a little alcohol, amid the acids, the ethers and the aroma of some liquors, or with the combined fruit-juice, malt, &c., may carry the system over some temporary infirmity, as the whip may cause the horse to leap forward when he cannot trust to his life forces.

If the hospital ambulance picks up a man well-nigh pulseless, the physician may fill his hypodermic syringe with brandy and digitaline without any discussion of food values or total abstinence, if so be statistical facts and clinical experience have shown this the most available substance for well-nigh mortal heart failure.

The scientific basis is that a chemical substance that is shown to be a toxic, a poison, a neurotic, is never needed in the healthy human body, and is not to the slightest degree indorsed for any use other than medicinal, by the fact that it may be available as a medicine. So far from that, the legitimate contention is that any such substance, because thus available, is all the more to be guarded against any use except that which is specifically prescribed in skillful adaptation to the symptoms in hand.

It is one of the satisfactions of modern medicine that amid much that must ever be empirical, it seeks to define more closely the indications and the limits of medicines and of alcohol among them. While there will ever be a host of promiscuous doctors, hypothetical doctors, experimental doctors, and "follow the fashion" doctors, and now and then one of these among the lights of the profession, there is nevertheless a prevailing tendency to precision. There is also in some respects, both in the light of science and clinical record, ground for closer definitions of the real availability of medicines.

The debate in the fall of 1888, in the Pathological Society of London, representing some of its best medical talent, led Dr. J. F. Payne, Dr. Lionel Beale and Dr. George Hay, to express very significant opinions on this subject.

Dr. Payne spoke of alcohol in its terrible effects on the functions of organs, its poisonous and destructive work on tissue and its interference with oxidation. He was fully supported by Dr. Harley, who claimed that "very moderate drinkers were in reality the most numerous class of alcoholic victims." Dr. Lionel Beale repeated and emphasized his well-known views. Since then Dr. Harley has given a series of lectures on the subject, which well represents the most thorough recent clinical beliefs as to the very restricted availability of alcohol in disease.

While exact clinical experiment and experience now narrow the sphere of alcohol, these regard it as available in sudden shock from injury, chiefly in the form of hypodermic injection with digitalis, as also for temporary use in sudden prostration until nutrients and other restoratives become preferable in its place, as is quickly the case. There is a narrow stage of fever and debility in which alcohol may be available. But it is to be borne in mind always that the stimulant effect is short and apt to be followed by depression, and that its chief effect is that of a neurotic. Since we have come to know the value of the various peptonoids and of their combination with beef, gluten, milk and flavoring oils or condiments, there is far less need for alcoholics. The appetizing effects of wines, &c., result full as much from flavors, such as œnanthic ethers, developed in them from the acidity, as from the alcohol itself. The fattening effect of beer to some results from the malt, &c., which now has an excellent substitute in the syrupy malt extracts. Alcohol, as it comes to derange organs, especially the liver, has much the same effect as is produced by a forcing process upon the livers of geese, which become abnormal. The more such geese weigh and the better they look so much the worse for the geese. No doubt by the clogging of organs there may be retention of materials and pent-up secretions which add slightly to bulk or weight, but it is only a storage tending to disease and not a storage of health.

The day is passed when, upon dietetic and medicinal grounds, there is any indispensable call for the moderate or habitual use of alcoholic beverages.

In the midst of the various alcohols and of all the manufactured and concocted mixtures which are now sold as if they were the real and pure product of the grape or of alcoholic distillation, we have better-known tonics and nutrients which effectually take their place, except to those who use them as pleasure-giving drinks.

The only design of this paper has been to state the findings of scientific and clinical research as to the dietetic value of alcohol. It cannot be overlooked that alcoholic beverages have most important bearings in their relation to the public health. Our desire is to give information to those who resort to the moderate use of alcoholic beverages with the idea that they have a food value. We need not argue here against intemperance as affecting health. It speaks for itself, and makes a record too palpable and commonplace to need argument. We rather desire that those who habitually and moderately use these beverages should know that they are not in the interests of good health. They tend to disturb function and to make organic changes in such organs as the brain, heart, liver and kidneys.

We need quote but three testimonies as fairly presenting the real view.

B. W. Richardson, M.D., F.R.S., of London, a leading physiological and chemical scientist, and an experienced practitioner, speaks thus:

> "I have learned purely by experimental observation that, in its actions on the living body, this chemical substance, alcohol, deranges the constitution of the blood; unduly excites the heart and respiration; paralyzes the minute blood-vessels; increases and decreases according to the degree of its application, the functions of the digestive organs, of the liver and of the kidneys; disturbs the regularity of nervous action; lowers the animal temperature, and lessens the muscular power. Such, independently of any prejudice of party, or influence of sentiment, are the unanswerable teachings of the sternest of all evidences, the evidence of experiment, of natural fact revealed to man by experimental testing of natural phenomena."

Dr. N. S. Davis, an ex-President of an International Medical Congress, and for forty years an active practitioner in Chicago, says:

> "There is no greater or more destructive error existing in the public mind than the belief that the use of fermented and distilled drinks does no harm so long as they do not intoxicate. 'It is not the *temperate use*, but the *abuse* of alcoholic drinks that does harm,' is the often-repeated popular phrase that embodies the error which helps to rob more than 100,000 persons of from five to twenty years of life in the United States, through the gradual development of chronic structural diseases induced by the daily use of beer, ale, wine, or distilled spirits, in quantities so *moderate* as at no time to produce intoxication. No more true or important remark was made in the noted discussion in the London Pathological Society, than the one by Dr. George Harley, that 'for every drunkard there were *fifty* others who suffered from the effects of alcohol in one form or other.'"

Prof. William H. Draper, a leading practitioner of New York, in an address on alcohol, before the New York Academy of Medicine, Nov. 1886, says, "That the effects of alcohols on nutrition are harmful and deteriorating to such a degree as to constitute the most powerful cause of physical degeneration at the present day, there can, I think, be no question. The drift of professional opinion in this country and in Europe is surely tending toward the restriction of their use as articles of diet, and simply for the reason that they are the determining cause of many functional derangements and structural degenerations."

The debate before the Pathological Society of London, 1888, expressed a general professional view in accord with what has been quoted. Since then the exhaustive clinical lectures of Dr. Harley, of London, have shown most fully the evil effects of moderate drinking and how much the public and individual health is involved in the habit. The subject is therefore worthy of the study of all sanitarians and of all who have been wont to regard such drinks as a source of vigor and as not involving any impairment of health.

SUMMARY OF REPORTS FROM LOCAL BOARDS,

AND LISTS OF MEMBERS AND HEALTH INSPECTORS, WITH ABSTRACTS FROM MOST OF THE REPORTS.

BY THE SECRETARY.

In October in each year, as required by law, a printed schedule of inquiries is sent to each Local Board of Health, also containing a blank for the names and post-office address of members of Local Boards and Sanitary Inspectors. The following is the schedule:

SUBJECTS FOR REPORTS.

A. Location, population and climate.
B. Geology, topography and contour.
C. Water-supply.
D. Drainage and sewerage.
E. Streets and public grounds.
F. Houses and their tenancy.
G. Modes of lighting.
H. Refuse and excreta (how managed).
I. Markets.
J. Diseases of animals.
K. Slaughter-houses and abattoirs.
L. Manufactories and trades.
M. Schools and school and other public buildings.
N. Alms-houses, hospitals and other charities.
O. Police and prisons.
P. Fire guards or escapes.
Q. Cemeteries and burial.
R. Public health laws and regulations.
S. Registration and vital statistics.
T. Quarantine, or care over contagious diseases and vaccination.
U. Sanitary expenses.
V. Heat and ventilation for dwellings.
W. Prevalent diseases of the year.

Other subjects may be named under X, Y, Z. The subjects may thus be referred to by the letters.

If the sheet provided is not sufficient, add others, marked with the letters which designate the topics treated.

If details on some of the subjects named have been furnished in former reports, these do not need to be repeated. But each item should be carefully examined, and full information given under R. It is always best to state what the Board has actually done. Under

W no disease should be reported as having been prevalent, unless the writer knows of at least ten cases during the whole year. The medical member of the Board should, if possible, give facts as to any epidemic that has occurred, and should note any special needs or defects in sanitary administration.

The following circular, which is also of use to draw the attention of Local Boards to the subjects committed to their care, accompanies each report:

CIRCULAR LXXIV.

OF THE

NEW JERSEY STATE BOARD OF HEALTH.

TRENTON, October 1st.

To Local Boards of Health:

Enclosed herewith please find an outline for the Annual Report for the year ending with this date.

In addition to the name and post-office address of each member of the Board, give also the same as to the Sanitary Inspector. The law now requires that each city, town or borough of over two thousand inhabitants shall have a *competent* Sanitary Inspector. In all the larger *townships*, or in those which have villages of several hundred persons it is provided by law that the State Board may require a Sanitary Inspector to be appointed, if in its judgment such an appointment is needed. In a township, if the Local Board fails to appoint, the State Board appoints the medical member of the Board of Health. Where there is a Township Physician he is not, by virtue of that position, the medical member of the Board of Health, but he or any other physician resident in the township may be appointed.

Under the schedules of subjects for report, in the case of cities and townships which have had Boards of Health and reported in previous years, it will not be necessary to repeat as to *A*, *B*, *E*, *G*, *I*, *O* and *P*, as most of the facts are on file.

In every case of report from a township, the name of any city, town or borough *in it* which has a separate Health Board should be given.

Under *A*, in the case of all cities, towns or boroughs, it is desirable to give the number of acres included in the incorporation and population per acre if known.

Under *C*, state exact source of water-supply, and when introduced. If a public supply, is it by the city or a private company? How many houses take it? Is the water ever discolored? Has it an iron or other taste? Is it hard or soft? Is it bad at any one season of the year? Are reservoirs or water-pipes cleaned? Does the source or stream from which it is taken receive any sewage above the point of supply? If from a stream, is there any examination made each year, or oftener, as to modes of pollution? Any other facts as to source, quantity or quality. How many depend on wells? How many on cisterns? Has the Health Board a list of houses that do not use the public water-supply?

D. As to drainage, state whether any system of drainage for the ground is used as distinct from sewerage. Is the usual water-level such as to secure dry cellars? If there are swamps near you, or malaria is frequent, give particulars.

As to *sewers*, state their construction, their grade or fall per one hundred feet, their size, their outfall, their flushing and ventilation, and whole length, and when introduced.

F. State whether houses generally have basements or cellars. If a city, whether the basements are occupied; if country, whether largely used for storage of vegetables. How many tenement-houses of more than two families? Is there a yearly house-to-house inspection?

H. State how far sewers are used, and what proportion of houses connect with them. Does your record show this? If cesspools, state whether they are cemented, or whether built with open bottom or sides. How are they emptied? What is done with the contents?

J. State any known or prevalent disease this year, and what month. Does the Assessor inquire each year as to losses of animals, and as to contagious diseases? If a city, is there a register of all persons keeping horses, cows, hogs, &c.?

K. Are slaughter-houses inspected, so as not to be a nuisance to neighbors?

L. Mention any new manufactories, and any nuisances from any factories.

R. Has your Board passed ordinances?

S. State who neglect returns and their post-office address.

Look carefully at each heading and state what you know.

Under *W*, do not put down a disease as prevalent unless you have personally known of at least ten cases. Under *X*, state what your Board has done the past year, and any sanitary investigations and improvements. Often the Physician of the Board should make out or aid in the report, and add such suggestions as occur to him; but let there be no delay to make return during October. We must trust chiefly to the Assessor, the Physician and the Inspector to keep the other members of the Board acquainted with health conditions, and with the rights and duties of the Board. Any neglects reported to us will be inquired into. Refer to Circulars XXXIX. and LX., and to Book of Circulars, for further information. Have on hand, also, Inspectors' Guide (Circular LXXV.), as furnished by State

Board. Your Board should each fall look carefully over all health conditions, as the winter is a good time for the cleansing of outbuildings and much other sanitary work.

We send occasionally, blanks for lists of physicians or undertakers, to be carefully corrected and promptly returned to this office. Cross off any deceased or removed, or who have ceased to practice. Add all new ones who have settled for practice within the city or township for which you make return. *Give name and post-office address plainly*, and only those residing in your city or township.

Keep informed as to the laws, and distribute the various reports and circulars of the Board. One or more members of your Local Board should attend the Annual Fall Meeting of the New Jersey Sanitary Association. Local Boards now have nearly or quite all necessary power. Even in small and very healthy townships, the Local Board should confer at the time the Township Committee meets, and keep so informed as to prevent nuisances or deal with any outbreak of epidemic. On receipt of postal, a copy of laws and references, or other circulars, is sent to each member of the Local Board whose post-office address is given.

Let the schedule, carefully filled out, be mailed to us in envelope herewith sent, not later than November 1st.

E. M. HUNT, M.D.,
Secretary.

We do not find it necessary to publish all of each report, and even those from which we publish nothing are of value for reference in the office. Our space permits us only to select such parts as are new, or as are of special interest to the locality and to this Board. Reports are in general promptly received, but a few Boards are dilatory, or seem to regard the report as a formality. They are so important that we must insist upon exact conformity to the law. Those who will examine the abstracts will not fail to get valuable information, and have opportunity to compare the work and methods of the various Boards.

We are not able to give always the names of all members of Boards, and sometimes, when they have not been formally organized, we give the name of the Township Committee and Assessor, who are members, and are responsible for local health conditions.

The law constitutes these as a Board, even before formal organization.

REPORTS OF LOCAL BOARDS OF HEALTH BY TOWNSHIPS AND COUNTIES.

AS SUMMARIZED AND ARRANGED BY A. CLARK HUNT, M.D.

ATLANTIC COUNTY.

ABSECON.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jeremiah Hand, M D., Clayton L. Higbee, Japhet Adams, Towers Townsend, James Townsend, Joseph Madden. E. H. Madden, M.D., Health Inspector. Post-office address of all, Absecon.

The health of Absecon town in the past year has, uninterruptedly, been excellent.

ATLANTIC CITY.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Borton, President; Henry S. Scull, George W. Shepherd, Julius Coty, William D. Hoopes, Jacob Leedom; M. D. Youngman, M.D., Secretary. Alfred T. Glenn, Inspector. Post-office address of all, Atlantic City.

The water-supply is from two sources—springs on the mainland and driven wells, 1,600 feet deep, on the island. Sewerage system consists of iron pipes, lead jointed, emptying into a cistern at Central Station, from which sewage is pumped to filtering-beds. The system, which, for a few years, was somewhat experimental, is now so perfect that all new buildings are connected with it, and seventy-five per cent. of the old buildings, or those existing at the time of its introduction, are connected therewith. During the last year large and commodious manholes, at convenient locations, have been built to enable frequent inspection and prevent clogging of pipes. All the school-houses were enlarged during the past summer to prevent overcrowding and keep pace with the phenomenal growth of the city.

All school buildings are provided with the most approved and carefully-constructed sanitary arrangements and plumbing. No burials are permitted on the island. During the year the city acquired by purchase a property, consisting of a house and several acres of ground, on the outskirts of the city, to be used as a place for the quarantine of contagious disease. One case of small-pox was cared for there during the year. Vaccination is compulsory upon all children entering the public schools. City Council appropriated $5,000 for the use of the Board for the current year. The Board has devoted itself especially, during the past year, to securing the filling of low lots and alleys to grade. Members have been active and faithful in their attendance at meetings and much good work has been accomplished.

M. D. YOUNGMAN, M.D.,
Secretary.

BUENA VISTA TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George B. Cake, Buena Vista; J. H. Smith, Richland; Jacob Blair, Buena Vista; Earnest A. Pierce, Secretary, Richland. C. W. Jones, Assessor, Richland, N. J.

EGG HARBOR CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George F. Breder, Lawrence Berchtold, William Bueller, Henry G. Regensburg. Valentine P. Hoffman, Secretary. Post-office address of all, Egg Harbor City.

In consequence of the excessive rains during the last winter and spring a number of complaints as to accumulation of water in the public streets and obstructed drainage were received and the same referred to the Common Council for removal. These requests have in some instances been attended to, although somewhat tardily. The chief cause of complaint, the obstruction of a public drain, has not been attended to, owing to the inactivity of the Council. No change in the present water-supply system of open and driven wells can be reported. The streets, public grounds and buildings are in good condition. A number of streets have been regraded and thoroughly graveled. Two cases of glanders were reported during the year; upon examination and report of veterinary surgeons, we ordered the owner to kill the infected animals, which request was immediately attended to and the premises disinfected. No diseases of cattle were reported. Lately parties lost a number of pigs by an unknown malady. The reports of vital statistics have generally been sent in promptly. Since my last report fourteen cases of diphtheria, four of scarlet fever, and one of typhoid fever have been reported; of these, three cases of diphtheria resulted fatally. The Board is at present engaged in revising and remodeling a code of health ordinances.

V. P. HOFFMAN,
Secretary.

EGG HARBOR TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. C. Fifield, Bakersville; Samuel A. Smith, English Creek; John J. Corson, Bargaintown.

GALLOWAY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Hansalman, Chairman, Egg Harbor City; Isaac Strickland, Oceanville; Israel Conover, Absecon; A. H. Higbee, Secretary, Leeds Point; E. H. Madden, M.D., Absecon.

All depend on wells; cellars generally dry. Malaria comparatively unknown. The Board has organized and adopted ordinances and ordered the same printed. We have no Sanitary Inspector.

A. H. HIGBEE,
Secretary.

HAMILTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James A. Blaisdell, John V. Beckett, Thomas A. Kean, Lewis W. Cranmer. H. C. James, M.D., Health Inspector. Post-office address of all, Mays Landing.

The Board of Health met April 6th, 1890, and organized. The Board decided to meet once every month, and publish the time and the place of meeting in the newspaper circulating in the town. There have been very few reports of nuisances made and no contagious disease occurred epidemically. The present water-supply is still procured from open wells, which are rapidly diminishing and driven wells taking their place. Some of the houses near the cotton mills derive their water-supply through pipes. This water being obtained from the Great Egg Harbor river. There have been about fifty new houses built since our last report, most of them to be occupied by the owners. Three horses have been afflicted with glanders and ordered killed, which order was promptly obeyed.

H. C. James,
Health Inspector.

HAMMONTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James H. Seely, Curtis S. Newcomb, Samuel R. Howland, Edward North, M.D.; A. J. Smith, Clerk. Post-office address of all, Hammonton.

The Board of Health have had no occasion for meetings this past year. No complaints of any kind have come to any of the members, to our knowledge. We have trouble in getting accurate returns from our Italian population. We fear that in the matter of births we fail to get the full quota. We have a population of between 500 and 600 of these people.

A. J. Smith,
Clerk.

MULLICA TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William B. Oliver, Pleasant Mills; Charles Saalaman, Egg Harbor City; George Huntsman, Nesco; W. S. Miller, Assessor.

WEYMOUTH TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Anderson Bourgeois, Estellville; Anderson Campbell, Tuckahoe; Anthony I. Parker, Sr., Tuckahoe. W. H. Campbell, Assessor, English Creek.

BOROUGH OF SOMERS POINT.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. H. Vansant, Allen Atkinson, George H. Cook, Mark S. Somers, William H. Keates. N. D. Vaughan, Borough Clerk. Post-office address of all, Somers Point.

Somers Point is situated on the west side of Great Egg Harbor inlet, bay and river; population 400; climate mild; water soft and clear, from springs and wells; drainage from surface. No malaria; no swamps near by. Houses with cellars used for storage. Cesspools and half surface. No slaughter-houses; no manufactories. One school-house, two rooms; canvas fire escapes to hotels. Two cemeteries. Law regulated by Council. No prevalent diseases.

N. D. VAUGHAN,
Borough Clerk.

BERGEN COUNTY.

BOILING SPRING TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. McKenzie, Carton Hill; James W. Roden, Rutherford; James P. Edwards, Rutherford. Geo. W. Sturges, Assessor.

ENGLEWOOD.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Abraham Tallman, President; James Harris, Henry J. Brinkerhoff, Hardy M. Banks, M.D.; Gilbert W. Chamberlain, Secretary. John T. Post, Health Inspector. Post-office address of all, Englewood.

Lies between Hackensack and Hudson rivers. Population 5,000; climate temperate. Water-supply from Hackensack and Hoboken Water Company; reservoirs at New Milford. Drainage by Citizen Sewage Company; emptying into Overpeck creek. Streets wide, with excellent macadamized roads. No public grounds. Two cases of typhoid fever latter half of October. No contagious disease. The town is divided into districts, over which the Inspector travels in search of any violation of the Local Health Board ordinances and reports the same at monthly meetings of the Board, when action is immediately taken to bring delinquents to a strict account for any violation of said ordinances. The deepening of Overpeck creek (at a cost of $4,000) is a recent improvement in the interest of health.

G. W. CHAMBERLAIN,
Secretary.

FRANKLIN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Ramsey, Oakland; Uriah Quackenbush, Wyckoff; Peter S. Winters, Wyckoff. John W. Ackerman, Oakland, Assessor. E. H. Hamilton, Oakland, Inspector.

The health of the township has been fair; we have had but one complaint. The Inspector looked after it and it was abated.

JOHN W. ACKERMAN,
Assessor.

HARRINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. L. Du Bois, Northvale; Isaac Kipp, Closter; R. B. Harring, Tappan, N. Y. C. N. Durie, Assessor.

HOHOKUS TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Murray, Assessor; Charles Young; Joseph Terwilleger, Inspector; William Thurston, John Ackerman, Charles P. Devoe, M.D. Post-office address of all, Ramseys.

LODI TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Adolph Kruger, Chairman, Carlstadt; Francis Feitner, Carlstadt; John Burke, Lodi; John Van Bussum, Secretary, Hasbrouck Heights. Oliver Soper, M D., Inspector, Lodi.

The water-supply for that portion of the town embracing Hasbrouck Heights, Woodridge and Carlstadt, is furnished by the Hackensack Water Company, and is pure. This is a great improvement, as the water was, in some instances, of inferior quality. In the village of Lodi there are some wells that are in questionable condition, owing to the close proximity of vaults, and to improper drainage of surface-water, &c. There have been a number of complaints concerning drainage. This matter is being attended to. A sewer system has not been adopted, but with the proper opening of ditches, already excavated, drainage would be in fair condition. There has been no systematic inspection from house to house to ascertain the condition as to tenancy, &c. There might be improvement in respect to disposal of refuse and excreta in some portions of the township. The health of the township has been good, except during winter and early spring, when we had our quota of influenza and the sequellæ arising therefrom. All complaints brought before the Board have been immediately investigated and acted upon as far as the power of the Board would warrant.

OLIVER SOPER, M.D.,
Health Inspector.

MIDLAND TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Albert J. Bogert, Chairman, River Edge; John G. Zabriskie, Rochelle Park; C. T. Zabriskie, Ridgewood. Nicholas G. Hopper, Assessor, Ridgewood, N. J.

HACKENSACK.

NEW BARBADOES TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. S. C. Wells, President; D. G. Jeffers, Secretary; C. E. Ekerson, C. F. Adams, M.D., F. H. White, M.D., E. B. Barkman, C. Conklin. M. W. Heath, Health Inspector. Post-office address of all, Hackensack.

Several miles of sewers, both brick and pipe, built during the year. The macadamizing of the streets is in progress; the past season several miles have been completed. The public grounds are kept in good condition. There is no house-to-house inspection. The Board adopted an ordinance concerning the business of cleaning cesspools. Markets are kept in clean condition; no complaints of any nuisance therefrom. One slaughter-house, well conducted; refuse carried off by tide-water. There are three public and one parochial school, ably managed; buildings well suited for the purpose. Hackensack Hospital is a worthy institution ably conducted. The sanitary condition of the jail is looked after by our Inspector. One old cemetery in the town, in which there are about six burials per year. Our ordinances have been printed in pamphlet form and a copy given to each householder. Expenses about $300 per annum.

D. G. JEFFERS,
Secretary.

ORVIL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

O. O. Blenis, Saddle River; O. W. Jennings, Saddle River; E. D. Leary, Hohokus. Charles W. Badeau, Allendale, Inspector.

There is nothing to report except we had a number of cases of la grippe last spring, and some of them fatal. There were also two cases of diphtheria that were brought from Paterson, but by careful quarantine the disease was prevented from spreading.

A. H. ACKERMAN,
Assessor.

PALISADE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Alfred Jarvis, Tenafly; M. Mackentire, Tenafly; C. J. Westervelt, Schraalenburg.

RIDGEFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Schlosser, Fort Lee; John S. Edsall, Leonia; Albert Ravekes, Ridgefield Park; Thomas F. Malloe, Nordhoff, Secretary; Joseph Huger, M.D., Fort Lee.

We are pleased to report that the past year has been remarkably free from epidemics of any kind. No contagious disease, with the exception of a few cases of diphtheria, from which no fatal results occurred. A great many complaints were acted on during the year, and the nuisances promptly abated under direction of the Board. The most dangerous case reported was an open cribbage on the Hudson river front, three or four acres in area, into which the New York city offal and garbage was being dumped. The Board took such action that the dumpage was stopped, and the place is now being filled with healthy clay material. The Board has passed ordinances.

THOMAS F. MALLON,
Secretary.

RIDGEWOOD TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

I. A. Marinus, President, Ridgewood; Thomas Terheun, Secretary, Hohokus; E. Vickerson, Ridgewood; M. T. Richardson, Inspector, Ridgewood; J. T. Demund, M. D., Ridgewood.

The health of the township has been about the same as in previous years. The principal work of the Board has been to impress upon the people the importance of keeping the township healthful. We have adopted the usual code and published and circulated the following:

"In adopting a code of regulations for the better preservation of the health of this township, the Board of Health does not wish to be understood as desiring to impose any onerous rules.

"Where houses in country villages are built close together, unless cesspools are constructed on sanitary principles, contamination of the soil is sure to result sooner or later, by which drinking-water is poisoned more or less, and such diseases as typhoid fever, malaria, diphtheria and kindred maladies are superinduced. With care in the construction of cesspools, and proper attention to them afterwards, little difficulty need be experienced in the direction indicated.

"For obvious reasons the *leaching cesspool* (simply a hole in the ground into which sink-water or other sewage is emptied) is the favorite form of construction. All sanitarians agree that this (from the standpoint of healthfulness) is the very worst plan ever devised for the disposition of house drainage.

"Until Ridgewood shall have grown to such proportions that it can afford to introduce a sewerage system, there would seem to be but one safe course for the people to pursue, and that is to abandon all leaching cesspools and build tight cesspools of brick, properly cemented. A tight cesspool carefully constructed and ventilated, and emptied periodically, may be regarded as comparatively safe.

"In localities where the ground slopes gradually rearward from the house for a distance of 150 feet or more, it is possible to introduce what is known as the 'Waring System' of house drainage. Where the conditions are favorable this is probably the best form of independent drainage for country houses. It is necessary, however, to have a certain fall from the house to employ this system successfully.

"If individuals in building houses will endeavor, in the arrangement of cesspools, to conform closely to the suggestions contained in this circular, and try to have wells located at least seventy-five to a hundred feet from cesspools (no matter how constructed), there will be little danger of coming in conflict with any of the regulations of this Board.

"In some cases it may be that a well located comparatively near to a leaching cesspool may apparently remain uncontaminated for a series of years, but it is well known that in many cases wells so located are fruitful breeders of disease.

"The Board would like particularly to dwell upon the necessity for properly testing all new pipes connecting the house with cesspool before using. Unless joints are very carefully made, leaks are liable to occur, which, being underground, cannot easily be detected. No drainage-pipe should ever run near a well or cistern. Pipes running from house to cesspool should be placed at least three feet underground, in order to avoid frost.

"It is suggested that those having improperly-constructed cesspools at present on their premises, would lessen their chances of contracting disease by reconstructing such cesspools in accordance with the above suggestions.

"It should be borne in mind that the Board of Health has full power at its discretion to enforce any of the regulations contained in the code adopted by them.

"In adopting this code and in presenting these suggestions the Board is influenced solely by a desire to improve the healthfulness of the village, and it is to be hoped that property-holders will endeavor, so far as possible, to conform to these regulations."

THOMAS TERHEUN,
Secretary.

SADDLE RIVER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry A. Hopper, Fair Lawn; Isaac A. Hopper, Fair Lawn; Peter Alyea, Dundee Lake; Albert Conklin, Garfield; Dr. Meak, Garfield.

No prevalent diseases during the year.

ISAAC A. HOPPER,
Secretary.

UNION TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

V. E. Downer, Lyndhurst; C. F. Harrington, Lyndhurst; John Kehoe, Lyndhurst; Alexander J. Davison, Kingsland; Dr. Trautwein, Inspector, Lyndhurst, N. J.

Water-supply from wells. Houses mostly frame, with one tenant. There have been no prevalent diseases this year. There have been several places where water has lodged, but upon notice to the owners the nuisance was abated.

WASHINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

BURLINGTON COUNTY.

BASS RIVER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. Garrabrant, M D., New Gretna; M. W. Adams, Assessor, New Gretna; John W. Harris, Harrisia; H. E. French, New Gretna; Levi French, New Gretna.

Located between Bass and Wading rivers. Population about 900. Climate mild. Consists of a sandy loam adjoining the salt marsh on the south, which extends to the Mullica river. Water is obtained from dug and driven wells, which are from ten to thirty-five feet deep. Drainage is natural and complete. Houses are in good repair. We have no slaughter-houses in town. There are five school districts in the township. The school-houses are in good repair. There are four cemeteries located back on the hill. Precautions are used on the part of the citizens to prevent the spreading of disease. If any one dies from a contagious disease the funeral is private. Vaccination is partly attended to. There have been no cases of contagious disease outside of one family having diphtheria.

BEVERLY CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. J. Currie, M.D., D. V. Soby, M.D., Hugh B. Ely, William K. Vansciver, George A. Smith, Joseph L. Simon. Charles F. Richardson, Inspector. Post-Office address of all, Beverly.

During the year ending October 1st, 1891, twenty meetings were held, at sixteen of which a quorum was present and business transacted. Over thirty complaints were received and investigated by the Inspector, and the causes removed or abated more or less permanently. Some could not be permanently abated until the grading and gutters were improved. On March 26th a supplement to our ordinances was passed in reference to the cleaning of cesspools and vaults by permit only, which resulted in over 100 permits being issued, 51 of which were from April 1st to May 11th. The Board was thus enabled to keep informed of how well such work was done and by whom. On March 26th a resolution was passed requesting City Council to have the gutters flushed during the summer months. On May 14th the President was appointed to confer with Beverly Township Board of Health regarding the bad odor from a fertilizer factory just outside the city limits. On July 9th the first case of diphtheria was reported to the Board and the family promptly quarantined. Since that date twenty-one cases have been reported, and the same course pursued as in the first case. Six cases having been reported to the Board on September 10th, the schools were ordered not to be opened until the disease seemed to be abated. They were re-opened September 21st with a diminished attendance. On September 29th a meeting was held to investigate the purity of the city water-supply, which is drawn from the Delaware river on the north side of this place. There were several members from City Council and others present. Three samples were taken from the pipes at different points and referred to Shippen Wallace, Esq., for analysis. There having been some fifteen cases of typhoid fever in Philadelphia (persons who were at the Grove House here in August), and it being thought by some that they became diseased while here, a thorough inspection was made of the boarding-house and such suggestions made to the owners as would put the place in good sanitary condition. These suggestions have been complied with in most instances. There was not sufficient ground, however, to warrant belief that the parties referred to were affected on account of their residence here. Three cases only of typhoid fever were reported to the Board as occurring in their jurisdiction up to October 1st. It should be said that there have been several other cases of allied fevers, but not positively declared to be typhoid. Since October 1st some three or four cases are known to have existed. The city needs a thorough system of scientific sewerage, and is favorably located therefor, but the expense attending the same will prevent its adoption until forced by circumstances and public demand. A system of water-supply by a pipe from city works, and no means of removing the liquid impurities, cannot long be a healthful combination.

CHARLES F. RICHARDSON,
Inspector.

BEVERLY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

L. R. Hibbard, Edgewater Park; George Conover, Bridgeboro; Chas. Russ, Beverly; **Joseph B. Carter**, Delanco. H. K. Weiler, M D., Inspector, Delanco.

There is nothing special to report from Beverly township, except the prevalence of diphtheria during the months of August and September. A number of cases were reported to the Board, of which three proved fatal. All necessary precautions were taken to prevent the disease from spreading, such as having wells and cesspools cleaned and the houses thoroughly fumigated and disinfected. There are now no cases within this jurisdiction.

JOSEPH B. CARTER,
Secretary.

BORDENTOWN CITY.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. J. B. Woodward, President; Clinton Mendenhall; William H. Shipps, M.D., Secretary; **William** McFarland, Dr. I. D. Young, Hugh Newell, F. G. Wiese. H. N. Jobes, Inspector. Post office address of all, Bordentown.

The past year has been one of activity in our Board of Health. Many subjects have occupied the attention of the Board at various times, some easy of solution, others requiring much time and careful study for their elucidation. The most difficult problem with which we have had to deal is the question of a "safe source of water-supply." I say safe, because under existing conditions it is physically impossible to secure perfectly wholesome water for domestic purposes. So long as the stream from whence we obtain our supply of drinking water is made a common receptacle or outlet for the sewage of a greater portion of the city, including several large manufacturing industries, employing in the aggregate some eight or nine hundred hands, to say nothing of other equally unsafe sources of contamination in close proximity to the pumping station, will the health of the citizens be placed in jeopardy. It is true our water company, with commendable zeal, recently introduced an excellent system of filtration that has made radical changes in the character of the water, as determined by Professors Leeds and Shippen Wallace, to whom specimens were sent for analysis, and who pronounced the same as fully up to the standard required for wholesome water. Nevertheless, the fact the pollution of the water continues and is likely to increase in direct ratio to increase of population, causes apprehension in the minds of many, lest the power of the filters will be unequal to the emergency. Sooner or later it will become necessary either to eliminate from the stream the present sources of contamination, or select some new point of water-supply, and the sooner either one or the other of these conditions is realized the better it will be for the health of the community. Recently the Board issued an order forbidding all persons contaminating the creek by human excretal matters, believing that if this element of danger were shut off a most deadly source of pollution would be eliminated. At different periods during the year some forty cases of diphtheria came under our notice, distributed over different sections of the city. Of this number nine died. As illustrating the contagious nature of this disease and the necessity for prompt action in dealing with its first approach, I will detail the following: During the month of July a family consisting of Mr. A., wife and eight children, living on the northwestern border of the city, remote from other buildings, was attacked with the disease. Just how it originated could not positively be determined, although the sanitary arrangements outside of the building were such as to invite rather than repel disease. The first child attacked with the disease died before the family was made aware of its nature, and before any steps had been taken to protect other members of the household. As a result, one after another of the family suffered from the disease, with a loss of three members of the household. When the first child died, a neighbor, Mrs. D., ignorant of the cause of death, agreed to prepare the body for burial. On leaving the house for her own home no precautions were taken, none being deemed necessary. In the course of a week or ten days two of her children were attacked with the disease, and one died. Across the road from Mrs. B. lived Mrs. C., with a family of six children, some of which had mingled with the B. children a few days prior to their being confined to the house. In consequence of this exposure, one after another of C.'s family were affected, with the result of the death of three children. About one-half a mile from A.'s lived farmer D., in whose home one of A.'s sons was a guest several weeks after recovery from the disease. During this visit he slept with the hired boy. Within one week the latter was attacked, and after a few days' sickness died. About this time another son of A.'s visited Philadelphia, spending the time with friends or relatives. In a few days after his advent a child in one of the families visited was taken with the disease and died. Thus, it would appear that A.'s family, directly or indirectly, was responsible for no less than six deaths. In the opinion of the writer, the disease should not have extended beyond the point first attacked, and doubtless would not, had proper precautions been taken at the start. When the Board of Health was notified, every precaution was taken to provide against further spread of the disease, but too late, it seems, to prevent the unnecessary loss of life. The other cases, for the most part mild in character, were located in remote sections of the city, and so far as could be ascertained had no connection with the cases before referred to. As a rule, physicians make prompt returns of contagious diseases, but in this instance, either from failure to recognize the character of the disease, or neglect, the Board was not apprised until the disease had made considerable headway. During August and September eight cases of typhoid fever were reported, two of which died.

An interesting fact in connection with these cases is, that one came from Canada with the disease, four used city water exclusively, and three depended upon wells for their supply of drinkng-water.

Our meetings are well attended, and frequently papers upon sanitary matters are read and discussed, and an effort made to keep alive an interest in all matters pertaining to the public health.

WILLIAM H. SHIPPS,
Secretary.

BURLINGTON CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

CHESTER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Perkins, Samuel S. Dager, George Brock. J. R. Mason, Assessor. Post-office address of all, Moorestown.

CHESTERFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George H. Warner, Chesterfield; John F. Rogers, Crosswicks; T. W. Ridgway, Chesterfield; C. B. Holloway, Chesterfield.

Water-supply is entirely from wells. Mostly dry cellars and good drainage. No swamps. Houses have no basements, with two exceptions. No houses with more than two families. No contagious diseases either among men or animals. Only one slaughter-house. No places of nuisance. No complaints to the Board of Health.

CINNAMINSON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William R. Lippincott, Chairman, Cinnaminson; E. H. Ogden, Riverton; Isaac Evaul, Palmyra. Timothy Morton, Assessor, Parry. J. D. Janey, M.D., Inspector, Cinnaminson.

Cinnaminson township is in the northwestern corner of Burlington county; contains a population approximating 6,000, and has a temperate climate. The surface is sufficiently rolling to rapidly and efficiently carry off all surface-water. The water-supply in Riverton and Palmyra is in part from the water-works and the balance by wells and cisterns; in the farming district it is entirely by wells and cisterns, except at Cinnaminson, where an extension of the Riverton and Palmyra system exists. The water from the various sources is excellent. The supply from the system is from a large spring. In Riverton a sewer has been placed on Main street, which will form the trunk by which to drain a large portion of the village. The balance of the township is drained by natural slope. The streets and roads of the township are kept in good condition. Telford roads are gradually replacing the old form of road-bed. There are no houses with more than two families. The refuse is collected in the villages by scavengers and carried into the country. Excreta are removed to the farms and utilized for fertilizing purposes. There have been no contagious diseases among animals. There is one slaughter-house in Palmyra, which is properly cared for. Schools are good and the school-houses sufficient for our needs. There is a children's country work home at Cinnaminson. There are five burial-places in the township, and but one which is objectionable, namely, the Methodist yard, near the church in Palmyra. The public health is properly cared for by the Township Board of Health, and we believe a better state of health has prevailed since the existence and use of the law. Cases of contagious diseases are quarantined to the best of our ability, and children are required to be vaccinated before they can attend school. There have been a few cases of scarlet fever in the township. There have been no sanitary improvements with the exception of the sewer above mentioned, and possibly better attention to duties than formerly by the Local Board of Health. We realize that conditions grow better every year as people see the advantage in observing the requirements of the law as exercised by the Board of Health.

J. D. JANEY, M.D.

DELRAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Yearly, Riverside; Thomas Fairbrother, Riverside; Henry Freck, Riverside; Abraham E. Conrow, Bridgeboro; Dr. Thomas P. Lippincott, Riverside.

Water-supply is all by wells. Houses in good order; no basements. Refuse and excreta carted away by farmers. Swamps near by. Malaria frequent. No rules or ordinances made by the Board. The Board has only been organized this year and has not done much as yet. There are several nuisances that should be abated, but as yet no action has been taken.

EDWARD YEARLY,
Assessor.

EASTAMPTON.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. Parker, Mount Holly; Isaac Uncles, Smithville; Aaron Willetts, Smithville; Richard M. Hall, Assessor.

EVESHAM TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David T. Ballinger, Richard H. Leeds, John J. Mitchel, P. V. B. Stroud, M.D. William L. Brown, Assessor. Post-office address of all, Marlton.

The Local Board of Health have nothing of any importance to report differing from former reports. There have been no prevalent diseases. There are two slaughter-houses in the village of Marlton, and one of them has been inspected and the Board did not think it necessary to pronounce it a nuisance, as it was in as good order as circumstances would admit.

FLORENCE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Kale, Assessor; Joseph West, Earl Gray, John Peacock. Charles A. Baker, M.D., Inspector. Post-office address of all, Florence.

Complaints made by members of the Board to those in authority at the iron works located here result only in promises in too many instances. Through the fear, apparently, of incurring their displeasure, some of the members hesitate to force them by law to abate existing nuisances. The streets and alleys of "Foundrytown" are unkempt and sometimes filthy. The drainage is poor, and on account of the topography, cesspools are mostly used. A slight epidemic of scarlet fever visited here in July, but no fatal result followed. Some typhoid fever occurred in "Foundrytown" during the summer (an unusual occurrence for Florence). There have been twenty cases of sporadic diphtheria during the year, none of which were fatal. Florence is an unusually healthy place, and, with proper sanitary precautions and fearlessness in carrying out the law, should be kept so.

CHARLES A. BAKER, M.D.

LUMBERTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

MANSFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John R. Nayler, William A. Townsend, David Sharp, Howard W. Parker, E. G. Van Marter, M.D. Post-office address of all, Columbus.

The health of this community for the past year has been good. We have suffered from no epidemics or contagious disease.

E. G. VAN MARTER, M.D.

MEDFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry Garwood, B. E. Wilkens, Edward Kirkbride. J. Reeve, M.D., Inspector. Post-office address of all, Medford.

The only epidemic diseases have been two distinct epidemics of influenza, one in January, lasting five weeks, and one commencing April 1st and lasting three weeks, covering nearly the same ground each time, and very similar to the epidemics of the year previous, except that the nervous prostration was not so great. For the past two months there has been a mild epidemic of catarrhal jaundice and a few sporadic cases of scarlet fever. As a whole, it has been a healthy year.

J. REEVE.

MOUNT LAUREL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. Andrews, Fellowship; Chas. H. Sordon, Mount Laurel; Samuel B. Lippincott, Hartford. Jos. K. Matlack, Assessor, Hartford.

NEW HANOVER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Benjamin Remine, Assessor, Wrightstown; L. D. Woodward, Cookstown; Thomas Platt, Wrightstown; M. V. Pullen, Cookstown.

Diphtheria has been reported in different parts of New Hanover township, but with no fatal cases. There have been no diseases of any kind existing among the cattle.

BENJAMIN REMINE,
Secretary.

NORTHAMPTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. C. Kingdon, Mount Holly; Isaac Huff, Secretary, Mount Holly; J. B. Longstreet, Mount Holly; R. L. Nixon, Mount Holly. R. H. Parsons, M.D., Inspector, Mount Holly.

The water-supply is taken from the Rancocas creek, and is furnished by a private company. The stream receives no drainage from the town above the point of supply. The water is soft and somewhat discolored. The reservoirs are cleaned twice a year. There is a system of drainage with a public sewer, which has been fully described in our previous report. We have an ordinance regulating the cleaning of cesspools. The general health of the town has been very good, with a few cases of diphtheria during the year. The hospital, children's home and schools are in good sanitary condition. The Board of Health meets regularly every month, and has abated many nuisances during the past year, in one case having the benefit of advice from the State Board.

PEMBERTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. S. Budd, Pemberton; Andrew H. Fort, Pemberton; Ivins Davis, Assessor, Pemberton; John N. Smith, Brown's Mills.

RANDOLPH TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. C. Adams, Lower Bank; William A. Maxwell, Wading River; Thomas R. Holloway, Harrisia; J. E. Carey, M.D., Lower Bank.

The Board has organized and the township is in a healthy condition.

WILLIAM JOHNSON,
Assessor.

SHAMONG TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Haines, Tabernacle; Henry Wright, Indian Mills; J. C. Buckage, Atsion. Winfield S. Haines, Assessor, Tabernacle.

With the exception of a few cases of diphtheria there is nothing to report.

SOUTHAMPTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles L. Rogers, Charles H. Haines, John W. Haines. John C. Brown, M.D., Inspector. Charles G. Naylor, Assessor. Post-office address of all, Vincentown.

The population is about 750. The Board met and passed ordinances, and there has been no necessity for further action.

CHARLES G. NAYLOR,
Assessor.

SPRINGFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Stockton, Jobestown; Isaac G. King, Jacksonville; Dr. Van Marter, Columbus; Samuel Emmons, Jobestown. Albert Evans, Assessor, Jobestown.

Water-supply from wells; drainage is good; houses well cared for, but one family occupying a house. There is one slaughter-house one-half a mile from the village, in the best of condition. The three school-houses are in good sanitary condition. There are three burial-grounds within one-half a mile of the village. There have been no prevalent diseases during the year; in fact, there have been very few cases of any one disease during the year.

ALBERT B. EVANS,
Assessor.

WASHINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Wright, Batsto; Frederick Meiners, Green Bank; Albert A. Sooy, Green Bank. A. E. Koster, Assessor, Green Bank.

The township has been especially healthy, and there is nothing new to report.

A. E. KOSTER,
Assessor.

WESTAMPTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. S Haines, Rancocas; C. Frank Gaskill, Rancocas; Japhet B. Deacon, Mount Holly; William L. Martin, M.D., Rancocas.

WILLINGBORO TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

WOODLAND TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John A. Bozarth, Vincentown; John S. Haines, Woodmansie; Samuel Lee, Shamong. Patrick Rowe, Assessor, Shamong.

The health of the people in this township for the past year has been excellent; there has been scarcely any sickness of any kind.

PATRICK ROWE,
Assessor.

CAMDEN COUNTY.

CAMDEN CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George S. Hammond, H. W. Miller, Charles Watson, Frank B. Delaplaine, John W. Donges, M.D., George B. Fortiner, M.D., Frank Burdsall. Eugene B. Roberts, Inspector.

Water-supply from the Delaware river and supplied by the city. Nearly all houses, with the exception of some in the outskirts, are supplied from the above source. The city has a good sewerage system. All premises abutting a street upon which a sewer is laid are compelled to connect therewith. In all, there are about thirty-five miles of constructed culverts or sewers in the city. Along the river front there are a few cellars which are troubled with water, especially at high tide. All swampy or low ground in the lower portion of the city is being gradually filled up. We do not have a house-to-house inspection. All cesspools are constructed of brick, with cemented sides and bottoms, and are emptied by means of an odorless excavating wagon, and the contents are taken out into the country. There have been no contagious diseases among animals during the year. All slaughter-houses are regularly inspected and are kept in good condition. There have been several factories or mills built during the year in the lower part of the city. We received a complaint in reference to an ammonia manufacturing establishment, but upon investigation the Board could not find anything prejudicial to good health. There have been two new school-houses built during the year, both of which are fitted up with all sanitary improvements. We have one hospital and two dispensaries, both being well-managed institutions. During the past year there have been about 600 cases of scarlet fever and diphtheria in this city.

CENTER TOWNSHIP

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Ezra C. Bell, Westville; Jos. M. Haines, Mount Ephraim; George H. Thomas, Haddonfield; J. H. Jackson, Secretary, Haddonfield; William B. Jennings, M.D., Haddonfield.

We are glad to say that there has been good health in our township with the exception of a few cases of typhoid fever, which have occurred this fall. These were traceable to contaminated wells. Our Board has not been called out during the year for the abatement of any nuisances.

J. H. JACKSON,
Secretary.

DELAWARE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John A. Meriditb, Haddonfield; G. Evans, Haddonfield; William T. Lippincott, Moorestown; William Graff, Ellisburg; W. D. Jennings, M.D., Haddonfield.

The general health of the township has been remarkably good. There have been no contagious diseases or typhoid fever. There were several cases of gastric fever in cattle in the upper part of the township, two of which proved fatal.

JOHN A. MERIDITH,
Chairman.

GLOUCESTER CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Duncan W. Blake; President; Daniel F. Lane, Secretary; Patrick Mealey, John K. Bennett, Inspector; S. S. Steer, H. M. Harley, John C. Stineson, Wm. Gerry. Post-office address of all, Gloucester City.

GLOUCESTER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Brewer, Blackwood; Charles Jenkins, Kirkwood; Joshua V. Sickler, Chew's Landing; Robert Yaggard, Clementon; Dr. Jos. E. Hurff, Blackwood.

The Board of Health has convened from time to time as deemed necessary for the health of the township. At the last meeting a great nuisance was removed by the draining of a slough-hole along the public road, which had become very unhealthy. The township had been generally healthy up to the last of August, when quite an epidemic of diphtheria broke out in our midst, there being eighteen cases in this vicinity. The public schools were closed for three weeks. The Camden County Almshouse, Hospital and Insane Asylum, located here, are in a most excellent sanitary condition. There have been no contagious diseases during the year.

JOSEPH E. HURFF, M.D.

HADDON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Stoy, Haddonfield; George B. Haines, Haddonfield; Samuel Wood, Haddonfield; R. T. Collings, Collingswood. Dr. William B. Jennings, Inspector, Haddonfield.

Water-supply from wells; never discolored; no iron or other taste. No sewer system; cellars generally dry. No swamps or malaria of any account. No tenement-houses with more than two families. La grippe was prevalent last winter. A few cases of typhoid fever have occurred. There are no slaughter-houses. There are five school-houses in the township. The children, with possibly rare exceptions, are vaccinated. There have been no contagious diseases requiring quarantine. The prevalent diseases have been la grippe, bronchitis, pneumonia and several cases of diphtheria and scarlet fever.

GEORGE T. HAINES,
Secretary.

HADDONFIELD BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Mr. Stewart, Mr. Roberts, Mr. Hillman, Mr. Ludlow and W. C. Nicholson, Secretary. Post-office address of all, Haddonfield.

Our Board has been recently appointed, and as yet there has been no cause for action. We anticipate trouble from the emptying of waste-water into the streets.

W. C. NICHOLSON,
Secretary.

STOCKTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. Merser, Pensaukin; Jos. Whitaker, Cramer Hill; Chas Pedigree, Fish House.

WATERFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. W. Bennett, Berlin; Jacob S. Bates, Berlin; William Haines, Marlton; Eayre Shark, Berlin.

This neighborhood is called a healthy one, as we are on the highest point between the Delaware river and the Atlantic ocean. There has been no complaint of any disease more than common. There have been a few fatal cases of typhoid fever.

EAYRE SHARK,
Assessor.

WINSLOW TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. M. Jewett, Winslow; Charles Albright, Elm; Ferman Peacock, Wilton; George Blatherwick, Ancora. M. G. Burdsall, Wilton, Assessor.

The health of the township has been generally good.

CAPE MAY COUNTY.

CAPE MAY CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. H. Phillips, President; W. F. Cassidy, Secretary; C. P. Foster, W. G. Essen, Jos. Hand. George Young, Inspector. Post-office address of all, Cape May City.

Our water-supply is the same as before reported. The water is clear and soft; there is no sediment and no taste. We have no list of houses that are not supplied; most all of them use the city water. We have a regular system of sewerage. Our cellars are, as a rule, dry. During the wet time of the past spring the water-level came within three feet of the surface almost everywhere, and few cellars escaped having water in them, something unknown for many years. Houses have no basements, as a rule. There is no house-to-house inspection, only when they are reported in bad order. Sewers run through most of the streets, and houses are generally connected with them. Cesspools, when used, are opened at the bottom, and the contents are removed and composted on neighboring farms. There have been no prevailing diseases. Slaughter-houses are not allowed in the incorporation. The Board has a code of ordinances. Our Sanitary Inspector is constantly on the alert in the spring, summer and fall looking after the sanitary condition of the city. New sewers are being added every year as needed, and our city is very free from any prevailing sickness; we have no malaria, and no swamps, but salt meadows, which are not considered unhealthy.

E. H. Phillips, M.D.,
President.

DENNIS TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Goff, East Creek; Morris Warwick, Dennisville; Edward W. James, Dennisville; George W. Post, South Seaville; Eugene Way, M.D., Dennisville.

The Board has been called on to act officially in but one case, that being to investigate the cause of nauseating odors arising from the so-called laboratory of a "nerve doctor." The laboratory was found in the second story of a tenement-house, and in it a quantity of herbs (saturated with urine) decomposing, the odor of which permeated the whole house. A number of bottles and jugs containing a foul, vile-smelling liquid were also found, and the whole house was damp and filthy. The nuisance was abated and the offending parties soon after left the village.

EUGENE WAY, M.D.,
Inspector.

LOWER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William L. Cummings, Fishing Creek; William C. Town, Cold Spring; George Dickerson, Cold Spring; William L. Ewing, Secretary, Cold Spring. Dr. James Mecray, Inspector, Cape May City.

Water-supply from wells and generally good. Houses are frame and mostly occupied by owners. Cesspools usually cleaned twice a year. Slaughter-houses are in good condition. We have four school-houses. Three are nearly new. The fourth is a poor concern, not fit to teach in. Our cemeteries are kept in good order. Our Board has not been called out to abate any nuisance or for any other cause. Upon the whole, we consider it a very healthy year.

W. L. EWING,
Secretary.

MIDDLE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Andrew J. Tomlin, Goshen; Howard C. Buck, Rio Grande; T. W. Garretson, Cape May Court House; Julius Way, M.D., Cape May Court House; S. H. Townsend, Burleigh.

The water-supply is from dug or driven wells. Most of the cellars have water in them in the wet time of the year. Houses do not generally have cellars. Cesspools are cleaned in winter, and the contents are used for fertilizing purposes. We have been very much favored during the past year; while there have been a few cases of typhoid fever and scarlet fever, the general health of the people of this township has been excellent. There have been a few cases of disease among horses, some ten or twelve having died from it. The people have come to know that the Board of Health is on the alert, therefore they do not think of dragging an animal off to the woods, but bury it immediately. We have an ordinance imposing a fine of $50 for neglect of this kind. S. H. TOWNSEND,
Secretary.

UPPER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Belford E. Smith, Tuckahoe; Griffith Corson, Petersburg; Sylvanus Corson, Seaville; R. S. Robinson, Tuckahoe; Randolph Marshal, Tuckahoe.

The Board of Health has had, during the past year, no occasion to complain of the sanitary condition of this district. Since our last report there have been a few isolated cases of true diphtheria, membranous croup, typhoid fever and la grippe. But the attacks were limited in number and widely separated, there being no means of communication. A canine disorder, almost universally fatal, prevailed here during the dog days; the animal was attacked with fever, great weakness, cough, and an eruption, most profuse about the abdomen, appeared during the second week of the disorder; if the dog survived this stage, nervous symptoms began to manifest themselves, subsultus, paralysis, convulsions, terminating in death. A few cases of cerebro-spinal meningitis in horses were noted along the coast.
RANDOPH MARSHAL,
Inspector.

OCEAN CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Steelman, Peter Murdoch, Sr., Jesse Conver, J. S. Waggoner, M.D. Post-office address of all, Ocean City.

A few cases of scarlet fever and one case of diphtheria are the only contagious diseases we have had. There seemed to be no necessity for making an inspection, therefore no officer was appointed for that purpose.

J. S. WAGGONER, M.D.,
President.

SEA ISLE CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles H. Clouting, James I. Soull, D. Harland, W. H. Rotan. Post-office address of all, Sea Isle City.

Population, 683; climate, temperate. Water from cisterns. The drainage naturally is carried to the meadows adjoining. Refuse and excreta are taken from the island once each week, outside of the borough limits. Sanitary expenses, $1,000. The Board of Health use this money mostly in removing excreta and filling up low lots. There is no disease that has taken any hold of the citizens. The Board has filled up under five dwellings where there was dampness, and also has filled several vacant lots, and has notified all property-owners to fill in where it is necessary. There are several damp cellars which the Board are taking action upon at the present time.

C. H. CLOUTING,
Assessor.

CUMBERLAND COUNTY.

BRIDGETON CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Maskell W. Applegate, Alfred Sharp, Dr. J. B. C. Thompson, Samuel W. Wells, Joseph H. Powell, P. Kennedy Reeves, William H. McGear, Charles P. McGear. Post-office address of all, Bridgeton.

The water-supply of the city is derived from Elmer's mill-pond. Improvements have been made during the past year. The water-works are owned by the city. The city authorities are about to establish a system of drainage and sewerage, their attention having been called to the matter by the Board of Health, and it is now being considered by them. Our houses are mostly owned by their occupants. Our Inspector gives a good deal of time watching the few tenement-houses there are in our city. The refuse and excreta are removed by regular licensed scavengers and garbage collectors, the scavengers doing their work at night and removing the refuse beyond the city limits. We have three slaughter-houses within the city limits, which are visited at least once in two weeks by the Inspector, and are kept in a clean condition. All public buildings are provided with fire-escapes. There are two cemeteries located just outside the city, and the laws relating to burial are strictly adhered to. The Board Physician pays particular attention and sees that all persons suffering from any contagious disease are quarantined, and in the case of persons dying from the same a public funeral is prohibited by the Board. The subject of vaccination of the school children was discussed at the last meeting of the Board, and the matter will receive immediate attention. The health of the city is good. Some few cases of diphtheria and typhoid fever have been reported during the year, and while the diphtheria was prevailing the Board instructed its Physician to visit the schools of the city and examine all scholars complaining of sore throat, and by this system an epidemic was avoided. The Board of this city is active, and bend all their energies to keep the city in a good sanitary condition. They have also gained the confidence of the people, who now work with and give all the assistance they can to the Board.

S. W. WELLS,
Secretary.

COMMERCIAL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Seth Bowen, Mauricetown; E. J. Cook, Port Norris; N. P. Lore, Jr., Mauricetown; David McElwee, Haleyville; Henry C. Mayhew, Mauricetown. Samuel Butcher, M.D., Inspector, Mauricetown.

Location, southern part of Cumberland county; population, about 3,500; climate, temperate; natural water-ways, such as found in all country places, carry the surface-water into the Maurice river and Delaware bay. General health has been good. The Board of Health has not been called upon during the year.

DAVID MCELWEE,
Secretary.

DEERFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Elijah R. Parven, Deerfield Station; Phineas Hires, Deerfield Station; Henry Dare, Rosenhayn; George Davis, Seeley. Charles C. Phillips, M.D., Inspector, Deerfield Station.

The supply of water is altogether from wells, and, with very few exceptions, its quality is excellent. Drainage is of the best, very little stagnant water being found anywhere in the township. The refuse and excreta are generally composted and used for fertilizing purposes. All animals have been remarkably free from disease during the past year. The slaughter-houses are managed so carefully as not to preve an annoyance to the community or detrimental to the public health. All the school-houses are conducted with obedience to the laws relating to such. The cemeteries and all burial-places are well managed. Vaccination is well attended to, both by the people themselves and by those whose duty it is to press the subject to their notice. There has been no epidemic during the past year, nor is there any cause for any, as the natural condition of the township is such as to be conducive to health.

CHARLES C. PHILLIPS,
Inspector.

DOWNE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles M. Joslin, Newport; R. H. Leeming, Newport; Nathaniel Lore, Dividing Creek; P. C. Henderson, Newport; Shepherd Campbell, Newport. Dr. A. P. Glanden, Inspector, Newport.

Population 2,000. Water from wells. Refuse and excreta used as fertilizer. Public health laws enforced by the Board. Throat diseases have prevailed during the year.

CHARLES M. JOSLIN,
Secretary.

FAIRFIELD TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. O. Davis, J. H. Elmer, Wm. M. Sheppard. H. B. Bamford, Assessor. Post-office address of all, Fairton.

GREENWICH TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel R. Mills, William P. Test, John Tyler, Jr., John N. Glaspell. Post-office address of all, Greenwich.

The Board of Health met the first of June and organized. Our town has been in a very healthy condition during the year, the Board having not been called out. There has been no epidemic, and everything seems to be in a good, healthy condition.

JOHN N. GLASPELL,
Secretary.

HOPEWELL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alfred Stathen, Bridgeton; Cornelius Sharp, Bridgeton; James F. Glaspey, Bridgeton; Walter Minch, Bridgeton; J. G. Swinney, M.D., Shiloh.

Slaughter-houses compelled to remove from Bridgeton city limits have located just over the line in this township. One of these is objectionable. A bone and fat-boiling establishment, likewise expelled from Bridgeton, became a nuisance and was abated. The Township Board of Health is well organized. Vital statistics are well attended to. During the year there have been frequent cases of diphtheria and scarlet fever of a mild type. Fumigation and isolation are promptly attended to, and even the families are now becoming familiar with the requirements, and beginning to realize the importance and advantages accruing from such a course. Vaccination has been neglected for years, and is not looked after by the Board. There has been an increase of malarial fever. Digestive and bowel troubles were prevalent among adults and children. Individual members of the Board of Health have occasionally been called to look after sanitary matters in the township. The sanitary laws are being respected by prompt abatement and removal of nuisances when pointed out by members of the Board.

J. G. SWINNEY, M.D.
Secretary.

LANDIS TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. L. Beck, M.D., James Chance, O. F. Recroth, Samuel Woolford, Sr. William W. Whiting, Inspector. Post office address of all, Vineland.

The sanitary condition and health of this township are excellent. Two slaughter-houses regularly inspected. The condition of the State Home for Feeble-Minded Women and Home for Feeble-Minded Children is excellent.

WILLIAM W. WHITING,
Inspector.

LAWRENCE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Lorenso D. Paynter, Harbert O. Newcomb, Peter Johnson, Henry Long, Charles C. Foster. Ephraim Bateman, Inspector. Post-office address of all, Cedarville.

Our water-supply is almost entirely from wells, ranging from a few feet to thirty or forty in depth. Driven wells are getting to be quite common in this section. We consider them preferable to the old surface well, and that in the end they are cheaper and more satisfactory. The outlet of our surplus water is Cedar creek, which has its origin near the center of the town. Our cellars are mostly dry. We do not suffer to any extent from malarial diseases. The rise and fall of the tide carries away any stagnant or polluted water. Cellars are mostly kept clean, whitewashed and free from impurities. Our citizens pride themselves in making our town neat and attractive. Cesspool material is used for fertilizing purposes. There have been no epidemics for the past year, and we have been remarkably exempt from the various summer affections. We have no slaughter-houses. Our Board of Health has not passed ordinances.

EPHRAIM BATEMAN, M.D.,
Inspector.

MAURICE RIVER TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

MILLVILLE CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edwin Conover, President; T. C. Wheaton, M.D., Secretary; S. C. Smith, Richard Radcliffe, Samuel Misskelly, L. H. Hogate. Post-office address of all, Millville.

The Board of Health has been quite active during the year and no epidemics have occurred; in the early fall there seemed to be a run of scarlet rash, but it was soon checked. The Inspector and the Board have been very watchful of cesspools, slaughter-houses and other disease-breeding places, and have insisted upon cleanliness. Alleys and lanes have also received attention, and every effort made to have all nuisances abated. The water-supply remains the same as in former years, and no complaints have been received. All manufactories are well ventilated and provided with necessaries for the comfort and convenience of the employes. The Mount Pleasant Cemetery, being under a new management, shows a marked improvement in many respects. The Board is endeavoring to prevent any more burials in what is known as the "Church-yard" because of increasing population. A system of sewers is badly needed in this city and the Board is doing what it can to press this matter. All the drainage is surface-drainage and there are several places that need constant care or they soon become very offensive. We feel that much good work has been done and that the year has been a healthy one.

L. H. HOGATE,
Secretary.

STOE CREEK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles B. Bowen, Shiloh; Edward Sheppard, Roadstown; James R. Rainear, Shiloh; Joseph Tomlinson, Roadstown. Ephraim Mulford, Assessor, Roadstown.

No tenement-houses of more than two families. There has never been a house-to-house inspection. Cesspool contents used for fertilizer. Nothing further to report.

EPHRAIM MULFORD,
Assessor.

ESSEX COUNTY.

BELLEVILLE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Wisscheesen, Charles Course, Daniel McMahon, Patrick McCoy, Richard Scaim, William Connelly, D. M. Skinner, M.D. James Dieghan, Inspector. Post-office address of all, Belleville.

There is nothing to add to former report, except that during the past year there have been three deaths from typhoid fever. The noticeable fact connected with these cases is that they all occurred in one family and were undoubtedly due to local causes. An inspection of the premises revealed the fact that the well from which this family obtained drinking-water had its capstone level with the flagging just outside the kitchen door and not more than thirty feet from the privy-vault, from which there was a slight descent. The vault was merely a slight depression in the earth, and it was the custom of the owner to draw out the contents from day to day, mix them with earth and scatter them over his garden as a fertilizer. The well has been closed. Three months have elapsed since the last case, and thus far no new cases have occurred.

D. M. SKINNER, M.D.

BLOOMFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Seymore P. Gilbert, President; Charles L. Seibert, R. S. Rudd, Lewis Cockefair, Martin Hummel, Charles H. Halfpenny, E. A. Rayner; Samuel H. Baxter, Secretary. William B. Corby, Inspector. Post-office address of all, Bloomfield.

Bloomfield is located at the base of the Orange mountains and is upon a coarse, gravelly soil. Population about 8,000 and steadily growing. The town is supplied with pure water from wells dug in the rock in the neighborhood of springs. A system of sewerage is under consideration, and natural drainage is good. The streets are being rapidly laid with Telford pavement. Cesspools are used for the waste from the houses, while garbage and other refuse are carted to regular dumping-grounds. There are no slaughter-houses in our limits, and no epidemics among animals have occurred. Our school buildings are large, well lighted and modern in every respect. A small hospital, with a board of lady managers, has been established for the use of this township and also Montclair township. The cemetery is well regulated. Vital statistics are collected promptly. During the months of January and February we had a second visitation of la grippe, though in a somewhat milder form than the previous one. With this exception, we have had a year of good health. Some cases of diphtheria have occurred and several cases of typhoid fever.

WILLIAM H. WHITE, M.D.

CALDWELL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. G. Jacobus, Secretary, Verona; M. W. Jenkins, Cedar Grove; C. A. Harrison, Caldwell; E. H. Baldwin, Fairfield; Samuel Dey, Fairfield; Edward E. Peck, M.D., Inspector, Caldwell; G. M. Canfield, Caldwell.

There have been no epidemics during the past year. Minor nuisances, when reported, have been promptly abated. The health of the township has been good.

CLINTON TOWNSHIP—IRVINGTON BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. M. O. Christian, President; Joseph Wolf, Ira Meeker, John B. Casing, Mahlon S. Drake. Dr. Joseph L. Wade, Inspector. Post-office address of all, Irvington.

The health of the village of Irvington during the past year has been good. Two or three cases of scarlet fever have occurred, with one death. No extension of the disease. The Board has given close attention to the sanitary condition of the village. No provision has been made for a scavenger, although it has been urged as a sanitary measure. The accumulated debris on small lots, occupied by tenants, is one of the nuisances requiring that some provision be made for its removal. Two wells were condemned; the close proximity of privy-vaults and cesspool-drainage contaminated the water. Both wells have been cleaned, but a driven well is the only remedy. There is no sewer system at present, but some plan must be devised at an early date for sanitary drainage.

JOSEPH L. WADE, M.D.,
Inspector.

CLINTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. H. Goldsmith, Lyons Farm; John T. Hunter, Secretary, Waverly Park; David G. Knight, Irvington; Lewis E. Voorhees, Irvington; William F. Heegan, Manhattan Park; Abraham Voorhees, Irvington. M. O. Christian, M.D., Irvington, Inspector.

During the past year the sanitary condition of the township has been very good. No epidemics have invaded our township. Very few complaints have been brought to the notice of the Board, and very little work has been done. The total expenses of the Board have not exceeded $25. Our only business so far has been the suppression of night-soil dumping by Newark scavengers, and two or three offensive piggeries and cow stables.

DR. M. O. CHRISTIAN,
Inspector.

EAST ORANGE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. E. Jepson, President; D S. Rice, A. H. Ryan, J. W. Ellor, A. Hibbins, F. Lang, C. E. Jerolomon, W. T. Bowman, F. A. Nott. I. L. Dodd, Assessor. Henry Blaurock, Inspector. T. R. Chambers, M D., Secretary. Post-office address of all, East Orange.

The population has increased in all wards of the township. Many new houses have been built. The sewer-disposal system of the town continues to work successfully. Gravel and charcoal filter-beds being continually added. The Town Committee intend employing a crematory for the destruction of all garbage gathered by the public scavengers. The public school system of the town is excellent. We have four grammar graded schools and a high school. A new building for the high school has just been erected, with the Fuller-Warren system of warming and ventilating. There have been no epidemics, and the year has been an unusually healthy one. The Board has done active duty during the summer.

T. R. Chambers, M.D.,
Secretary.

FRANKLIN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Foster, Avondale; John H. White, Avondale; J. Bes. Freeman, Nutley; Joseph Searles, Nutley; James W. Sargent, Nutley; Amsi Coeyman, Nutley. J. B. Philhower, M.D., Inspector.

We have made several investigations and abated nuisances. The water-supply is from a private company. Eighty houses take it.

LIVINGSTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Flynn, Livingston; Peter S. Meeker, Roseland; William Deicks, Livingston; Anderson P. Squire, Livingston; George L. Smith, Livingston; George E. De Camp, Roseland; Dr. E. E. Peck, Caldwell.

There have been no prevalent diseases of any kind in the township for the past year. Health has been generally good. No complaints have been made to the Board during the year.

GEORGE E. DE CAMP,
Assessor.

MILLBURN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George H. Richmond, Short Hills; E. B. Renwick, Millburn; J. D. Parkhurst, Millburn; A. V. Oakes, Millburn; Bertram Young, Secretary, Millburn. Isaiah Williams, Assessor, Millburn. John D. Polhemus, Inspector.

Population, 2,300. Since last report, ponds are in process of being drained. Nothing further to report.

BERTRAM YOUNG,
Secretary.

MONTCLAIR TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Wilson, W. W. Underhill, Dr. M. W. Ayres, A. A. Sigler, J. B. Pier; Charles B. Morris, Secretary. Richard P. Francis, M.D., Inspector.

The water-supply is drawn from nine artesian wells. Two hundred and thirty thousand gallons per day are supplied to 934 consumers, which means that nearly half the houses in town now use city water. Arrangements have been made whereby the new main of the East Jersey Water Company will be tapped, and from this it is calculated that an additional supply of 2,500,000 gallons per day will be obtained. Negotiations have been practically concluded at Orange that connection be made with the new trunk sewer that is being constructed. Work will probably be begun here in the spring. The carrying capacity of the new sewer is to be 4,200,000 gallons per diem, and the contents are to be carried to tide-water. The general health of the town has been excellent. There has been no epidemic.

RICHARD P. FRANCIS, M.D.,
Inspector.

NEWARK CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Tyler Parmley, President, 161 Roseville avenue; Edward Dunn, 104 Market street; William B. Guild, 3 Lagrange Place; Dr. Herman C. H. Herold, 75 Congress street; Alex. H. Johnson, 1000 Broad street; Dr. Fred'k B. Mandeville, 1021 Broad street; Samuel S. Sargeant, 84 Mount Pleasant avenue; Moses Straus, 1085 Broad street; Dr. Charles M. Zeh, 481 Broad street. William Titus, M.D., Health Officer and Secretary, Seventh and Orange streets. Chauncey G. Parker, Attorney for Board, 802 Broad street.

On account of recent changes, and special duties as to small-pox since coming into office, the usual report was not received from Newark. The newly appointed Health Officer is Charles Lehlbach, M.D.

ORANGE CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry H. Truman, President; Augustus Eichhorn, Francis Treault. Charles Buttner, M.D., Inspector. Post-office address of all, Orange.

The problem of sewerage in Orange has received attention for a long term of years, and several reports have been made to the Common Council in reference to it. The Legislature of 1890 passed a law authorizing the Common Council, under certain restrictions, to provide a system of sewers and drains for the whole city by a gravity outlet to the Passaic river. Work was begun early in the summer and has progressed very favorably up to the present time, and it is expected that before the end of two years Orange will be blessed with a complete sewer system.

CHARLES BUTTNER, M.D.,
Secretary.

NOTE.—With this report there was added a full description of the different portions of the town to be sewered, with the sizes of pipes, &c.

SOUTH ORANGE VILLAGE.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. F. Church, William J. Nevius, Arthur Babson, H. A. Mandeville, M.D., William F. Allen, Isaiah Ball, Frank A. Wright. William J. Chandler, Inspector.

The water is pumped from driven wells, near Summit, into a stand-pipe, at an elevation sufficient to force water by gravity to a point 250 feet above the lowest parts of the village. This supply was introduced during the present year. About one-third of the population are thus supplied, and two-thirds still use wells and cisterns. The water is clear and is uniformly good. The wells are in an unpopulated district, and for many years will remain free from sewage pollution. The quantity for the present is limited to 1,000,000 gallons daily, which is more than ten times our present consumption. We have no system of drainage or sewerage, but one is under advisement. No house inspection, excepting upon some complaint. The work of the Board has been chiefly in abating nuisances arising from imperfect cesspools or foul privy vaults.

WILLIAM J. CHANDLER,
Inspector.

WEST ORANGE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

GLOUCESTER COUNTY.

CLAYTON BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Moore, George Tomson, Robert M. Warner. H. G. Buckingham, M.D., Inspector. Post-office address of all, Clayton.

There has not been any epidemic during the year and health has been universally good. The rainfall during the spring months was very heavy and a large number of cellars contained water for weeks at a time, but no case of sicknees was traced to such cellars as the cause. The Health Board urged the importance that nothing rotten or offensive be left in the cellars; also, that excreta should be covered with earth and not left on the surface. Hogs are allowed to be kept in the borough. The Board has complaints from time to time of the filthy condition and bad odor from these pens. The owners are required to lay floors and use plenty of dry litter for absorbent The water-supply is entirely from wells. Probably in the near future the soil will be so saturated with sewage that the water of many wells will become impure. There is need of a more thorough system to prevent the accumulation of garbage and refuse in back-yards and streets. While the Board of Health has been on the alert for the removal of nuisances, the members have been desirous to do more in the way of their prevention.

H. G. BUCKINGHAM, M.D.,
Inspector.

CLAYTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William A. Williamson, Samuel C. Newkirk, Francis M. Pierce, Samuel S. Fisler, M.D. Dr. H. G. Buckingham, Inspector. Post-office address of all, Clayton.

DEPTFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. P. Steward, Westville; H. M Leap, Wenonah; Jos. Noblit, Wenonah; William C. Cattell, Secretary, Wenonah; Dr. H. A. Stout, Wenonah.

Deptford township is located at the north end of Gloucester county. It includes the town of Westville, borough of Wenonah, village of Almonesson and what is known as Woodbury Park. The rest of the township is farming district. The soil is loamy with streaks of sandy and gravelly soil through it. The water-supply is from wells, excepting Wenonah, where they have water-works. The water is generally very good. The drainage of the meadows at Westville is very poor, causing more or less malaria in August and September, the cause of poor drainage being due to the fact that the meadows are lower than the high-water mark of the creek and river. There are very few cesspools except in Westville and Wenonah, and these are emptied by carts. We have had no prevalent disease among stock of any kind this year. There is but one slaughter-house in the township, of which there has been no complaint. The Board passed health ordinances this year. The Board was required to meet in September to investigate the cause of several cases of typhoid fever and malaria at Westville. A careful inspection of the town was made and a few cesspools and a gutter were ordered cleaned, and the ditches and the meadows adjoining the town were ordered opened. These orders were very cheerfully obeyed and the disease gave the inhabitants of that vicinity no further trouble.

WILLIAM C. CATTELL,
Secretary.

EAST GREENWICH TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles E. Haines, Mickleton; William Dorson, Mickleton; E. H. Steward, Clarksboro. H. L. Haines, Assessor, Clarksville.

FRANKLIN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Tyler, Newfield; Samuel Lowder, Newfield; Charles D. Smith, Munsonville; Joshua C. Richman, Malaga; A. A. Smith, M.D., Malaga.

GLASSBORO TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

GREENWICH TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. A. Jester, Paulsboro; H. W. Miller, Paulsboro; Eli B. Allen, Gibbstown; Jacob Ballinger, Paulsboro.

Water-supply from open wells principally; some few driven wells. After continued rains, the water in the surface wells becomes discolored. Cesspools not cemented; contents used on farms. No prevalent diseases.

JACOB BALLINGER,
Assessor.

HARRISON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Christopher Knisell, Mullica Hill; Joseph Kirkbride, Richwood; Jonathan Foster, Jefferson. Dr. E. E. De Groff, Mullica Hill, Secretary. Eli Heritage, Assessor.

LOGAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hans Helms, Repaupo; Joseph R. Beckett, Bridgeport; Smith Shoemaker, Bridgeport; J. C. Helms, Repaupo. E. T. Oliphant, M.D., Inspector, Bridgeport.

MANTUA TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter P. Watson, Pitman Grove; Charles H. Ferris, Pitman Grove; John Sharp, Barnsboro; Franklin Denn, Mantua. Dr. E. Z. Hilegass, Inspector, Mantua.

We derive our water-supply from wells; occasionally discolored; no taste. Our cellars are dry. Occasionally we have malaria, but nothing serious. No tenement-houses of more than two families. Cesspools are not cemented; they are built with open sides, and their contents are carted onto the truck farms. We have had an epidemic of scarlet fever during the months of April and May. Our slaughter-houses are inspected thoroughly. Our Board has passed ordinances. Our public schools as well as houses are in excellent condition. Our cemeteries and burials are conducted strictly in accord with the instructions laid down by the Board of Health. Contagious diseases are isolated, disinfected, &c. Vaccination is very much neglected. The prevailing disease of the year has been scarlet fever in a mild form; a few cases have succumbed to the disease. Our Board has met at the usual appointed time for consultation over matters connected therewith. The Inspector was ordered to inspect slaughter-houses, outhouses, pig-pens, &c., with instructions to the owners to keep everything in proper order, as required by the Board of Health.

DR. E. Z. HILEGASS,
Inspector.

MONROE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. B. Sickler, Chairman; D. S. Champion, H. K. Bugbee; John W. McClure, Secretary. J. Gaunt Edwards, M.D., Inspector. Post-office address of all, Williamstown.

There is a population in the town of 1,600; in the rural district, 400. Climate is inland or continental, but owing to the numerous cedar swamps and level, flat surface, it is very damp, and heavy mists and fogs occur. The water-supply is wholly from wells. These average from fifteen to twenty feet in depth. While the water is hard, it is of excellent quality. The refuse of the slaughter-houses is removed from the town. Contents of cesspools are used for fertilizing purposes. There are two slaughter-houses in the town, and these are carefully looked after by the Health Inspector. But little butchering is done in summer. There are three cemeteries in the heart of the village. A code of laws was adopted and the requirements are vigorously carried out. An epidemic of diphtheria broke out in four or five families, but by prompt action of the Board in isolation, disinfection and destruction of clothing, the disease was soon arrested. The prevalent diseases have been malaria and la grippe. Diphtheria and German measles also prevailed. The Board at once investigates all complaints, chief of which was the unloading of car-loads of manure in the town limits. This was ordered stopped by the Board.

J. GAUNT EDWARDS, M.D.,
Inspector.

SOUTH HARRISON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alfred Lippincott, Joseph Cheeseman, Charles K. Horner, Harry Lefferty. Post-office address of all, Harrisonville.

This is strictly an agricultural township, with one village of about 100 inhabitants. The Board has not been called upon to investigate any nuisances.

WASHINGTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas H. Hurff, Hurffville; B. Frank Allen, Hurffville; Evan Davis, Hurffville; Charles D. Nicholson, Turnerville; O. B. Phillips, M.D., Hurffville.

Our Board met last spring, as usual, and organized. No nuisances reported to the Board. The township is in a healthy condition.

CHARLES B. NICHOLSON.

WEST DEPTFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John C. Budd, Joseph A. Moore, John W. Leonard; Dr. H. A. Wilson, Inspector; Mark Clement. Post-office address of all, Woodbury.

There has been complaint about one of our slaughter-houses. The Board notified the owner, who has endeavored to remedy the nuisance, but owing to the location it is impossible to remedy it entirely.

MARK CLEMENT.

WOODBURY CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Walton, William M. Carter, George K. Carroll, Warner Underwood, John C. Tatum. T. E. Parker, M.D., Inspecter. Post-office address of all, Woodbury.

City water has been introduced into nearly every house, and wells and cisterns are being rapidly filled up and abandoned. The water has been very pure during the last year, great care having been used by the Water Committee to get reservoir and pipes clean. There has been no system of sewerage adopted, water-closets and sinks being emptied into ventilated, open-bottomed cesspools, which are emptied by bucket and the contents carted away and used as a fertilizer. Cellars are generally dry, but the unusual rainfall has caused many to be damp; but water does not remain long after a storm, and most of them are supplied with drains. The health of the city has been good, the only contagious disease reported being a few isolated cases of scarlet fever. There is one slaughter-house, which the proprietor endeavors to keep in good condition. No hog-pens are allowed. The Board of Health has endeavored to abate all nuisances and encourage residents to keep yards and surroundings clear of all rubbish and decaying fruit and vegetables.

T. E. Parker, M.D.,
Inspector.

WOOLWICH TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Howard V. Locke, Charles P. Batten, George Meley, Samuel Avis. Benj. F. Busby, M D., Inspector. Post-office address of all, Swedesboro.

The Board met in April and organized. The laws relating to Boards of Health were discussed and each member instructed to report to the Board any complaint of any nuisance that might be brought to his notice. A meeting was held again in August to take some action on several complaints made concerning the unsanitary condition of various hog-pens in Swedesboro, which, upon investigation, it was found had been caused by excessively wet weather, and upon notice being served upon the owners the nuisance was, in every case, abated at once.

Samuel Avis,
Secretary.

HUDSON COUNTY.

HUDSON COUNTY BOARD OF HEALTH REPORT.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Leonard J. Gordon, M.D., President; Charles B. Converse, M.D., C. Holmes McNeil, M.D.; H. W. Winfield, Counsel; C. J. Rooney, Jr., Clerk. Post-office address of all, Jersey City.

In the following may be found a brief summary of certain matters of sanitary interest which have come before the Board of Health and Vital Statistics of Hudson County since our last report. The question of building a pest-house for the reception of cases of contagious diseases other than small-pox, has been under consideration, and all that is necessary is a sufficient fund, which in time will be forthcoming. This Board had expected to have the structure almost completed by this time, but it was found that such a building as was absolutely necessary could not be erected with the sum in hand, so it was determined to wait until a sufficient capital had been accumulated. Complaint against the asphalt factory on west side of Jersey City had been received. The Board took a census of the opinions of the residents immediately surrounding. The conclusion was arrived at that the odors did not constitute a nuisance. Numbers of sunken lots in various parts of the cities of the county have been filled up by order of the Board. There are large sections, however, which are more or less covered with water, to which owners have apparently abandoned claim, by reason of taxes unpaid. No plan has yet been found to compel the filling up of such land. The Board discovered encroachments upon the Mill creek, which drains a portion of Jersey City, and the Board of Street and Water Commissioners were requested to prevent such obstructions. The manure piles that were situated on the northern end of Jersey avenue, Jersey City, have been removed. No more storing is allowed there. After much trouble, certain scavengers were caught dumping night-soil on certain of the roads of the outlying towns of the county. Suits were brought, and judgment obtained. The extension of the Jersey City Grand street sewer across Mill creek, has been urged by this Board. Unsanitary plumbing, &c., in several schools was rectified by the Board; directly in one case, and by request in others. The need of a sewer from Central avenue to Oakland avenue, Jersey City, on St. Paul's avenue, having been shown by petition to this Board under the statute, the Board inspected the region, and certified the facts to the Mayor and Aldermen. Nothing has been done in the matter of building the sewer. The practice of drying hog-hair on the Hackensack meadows has been curtailed, and very little is now being dried there, and that only in cold weather. Several uninhabitable houses have been ordered vacated by the Board. A large number of houses was connected with sewers by the Board's direction. The attention of the Board of Water and Street Commissioners was called to the needs of drainage to choked sewers, and generally with good results. The subject of stagnant ponds in the northern section of the county, received the attention of the Board. An inspection of the sewers of Belmont avenue, Astor place and other adjoining streets of Jersey City, was made in endeavoring to account for certain typhoid fever cases which occurred in that section. Suit against the Board to compel the recognition of diplomas issued by the New Jersey Medical College of Medicine and Surgery, was decided in the Board's favor. Supervision of contagious diseases occurring among school children, is still kept up by the Inspectors. The condition of School No. 10 was declared by the Board to be detrimental to health, and finally the closing of the school was urged. The Board of Education made certain indicated improvements which obviated the trouble. The Lehigh Valley Railroad Company was directed by the Board to at once re-open all natural water-courses, closed by them in constructing additional road-bed running southwest of the line of Central railroad, in the vicinity of Claremont station. The filling of certain sections with ill-smelling refuse was stopped, and the use of clean earth top-dressing ordered. The President of this Board was invited, in March, to serve on a committee to consult with the Governor in regard to plans for improving the sewerage of Jersey City. These are a few of the more-easily recollected matters that have engaged the attention of this Board during the past year.

C. J. ROONEY,
Clerk.

BAYONNE CITY.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William C. Farr, John W. Goddard, William Boroughs, F. F. Martinez, Jr., Dr. B. V. Morris, James Reilly, George Schmidt.

The Passaic water has undoubtedly been worse this year than it was last. It was reported, and I am inclined to think correctly, that the Montclair Water Company referred to last year will be supplying the city with good water before the summer of '92. Sewer construction has been fairly active. There have been about three and one-half miles of sewers constructed, and numerous applications to City Council for sewers are now pending. There is no yearly house-to-house inspection. The garbarge contractor's work since May has been much less satisfactory than for the year previous. This is owing to the contract being awarded to the lowest bidder, and the lowest bidder, through insufficient comprehension of what was required of him, having made a contract at figures which do not enable him to do the work properly. The same conditions as to disposal of garbage prevail as last year, and complaints as to it have been made again this summer. Privies and cesspools are emptied by licensed scavengers and in a fairly satisfactory manner, as described in our last report. The new Board of Health has passed a code of ordinances which is now being published. Prevalent diseases have been—In the fall and early winter, rubeola; in the winter and spring, rothëln and la grippe; this summer, intermittent fever, &c., and typhoid fever. Both the latter diseases, but especially the former, have been especially prevalent during the past three months.

F. F. Martinez,
Secretary.

HOBOKEN CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Palmer Campbell, W. H. Wall, John Tallon, Stephen Isola, Lewis V. Hengstler, Dr. C. B Simon, Antonio Grenelli. Post-office address of all, Hoboken.

Water-supply from Hackensack river and New Milford. Drainage insufficient and imperfect. Streets and public grounds are kept in fair condition. Houses are largely tenements and flats and a number of small one-family houses. The Board is looking into the enforcing of the cleaning of closets, up to this time very improperly attended to. No disease of animals reported. One hospital; in good condition. All new buildings have fire-escapes. A sanitary code has been passed in accordance with the law. Collection of vital statistics just started in October. All houses where there is contagious disease are ticketed. The children dwelling in them are quarantined.

PALMER CAMPBELL,
President.

WEST HOBOKEN.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. Righter, W. H. Lann, John W. Tanner, John Lane. Louis Michael, M.D., Inspector. Address of all, West Hoboken.

HUNTERDON COUNTY.

ALEXANDRIA TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

BETHLEHEM TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

P. T. Hoffman, Bloomsbury; Stewart Rodenbaugh, Norton; Joseph Mayberry, Junction; George A. Hackett, Bloomsbury.

CLINTON BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Erastus Runyon, Chester Wolverton, Samuel Voorhees, William Knight, M.D. James R. Kline, Inspector. Post-office address of all, Clinton.

Depend for water-supply on wells and cisterns. Nothing but natural drainage. Cellars are dry. No yearly house-to-house inspection. Cesspools are not in common use. No slaughter-houses in the borough limits. We have had a malignant form of diphtheria, but not prevalent to any great degree. Our Board has caused the abandonment of slaughtering stock in the borough and the sanitary inspection of all places where diphtheria prevails. All means were used to prevent the spread of the disease.

JAMES R. KLINE,
Inspector.

CLINTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John C. Cramer, Annandale; Jacob S. Hulsizer, Annandale; Luther Hoffman, Lebanon; B. B. Berkaw, Annandale; W. E. Berkaw, Annandale.

In reference to schools, the Board begs to report the unusually large number of children who have not been vaccinated. This is due to the absence of a "small-pox scare" for several years and may lead to trouble in the future. Expenses of the Board have been very small during the past year, owing to absence of complaints, and also by reason of an increased observation of the general laws of hygiene. The early months of 1891 were attended with the development of many cases of the pandemic influenza—"la grippe"—but very few deaths resulted and they were in the aged and infirm, being complicated by bronchitis or marked inanition, from which paralysis resulted. Measles were epidemic during the winter and spring of 1891, but not in a severe form. Whooping-cough also prevailed to some extent. The Board have had but two meetings during the past year.

WILLIAM E. BERKAW, M.D.,
Inspector.

DELAWARE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. George N. Best, Inspector, Rosemont; Nelson Lambert, Sergeantsville; Isaac Lake, Sergeantsville; John F. Sherwood, President, Stockton. Jacob H. Holcombe, Lambertville, Assessor.

Had four meetings. Have attended to complaints as to bad drainage, hog-pens, &c. One fatal case of diphtheria and scarlet fever; a few other cases beside.

JACOB H. HOLCOMBE,
Clerk.

EAST AMWELL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Van Marter, Ringoes; Van Doren Locey, Ringoes; Theodore Craft, Wertsville; Levi Holcomb, Ringoes. Dr. P. C. Young, Inspector, Ringoes.

The health of East Amwell township has been comparatively good for the past year. No zymotic diseases have invaded our border except two or three cases of measles and about as many of scarlet fever. The last was confined to one family only. Epidemic influenza prevailed about as the year previous. A great many old people succumbed to the disease and its complications. The sanitary condition throughout the township is excellent.

P. C. Young, M.D.,
Inspector.

FRANKLIN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Q. E. Snyder, Quakertown; E. B. Suydam, Pittstown; J. K. Robertson, Quakertown; J. A. Snarer, Cherryville; George W. Snyder, Quakertown.

FRENCHTOWN BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. B. Nash, M.D., President; Robert McIntyre, Thomas Able, George F. Bloom, O. R. Kugler, Secretary. Post-office address of all, Frenchtown.

Source of water-supply, wells and cisterns; drainage by public highways. The water-level is such as to secure generally dry cellars. We have no system of sewerage. Do not know of any prevalent disease. The Assessor does not inquire as to the diseases of animals. We have passed no ordinances this year.

O. R. Kugler,
Secretary.

HIGH BRIDGE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. O. Aller, High Bridge; D. M. Sharp, Annandale; S. Apgar, Cokesbury. S. W. Dorland, Assessor, High Bridge.

HOLLAND TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jordan Shafer, Milford; John Weider, Finesville; E. D. Huff, Warren Paper Mill; Dr. J. N. Lowe, Milford. Matthias Wean, Mount Pleasant, Assessor.

The health of the township has been good the past year, no fatal diseases prevailing.

KINGWOOD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Kugler, Tumble; Augustus Field, Baptisttown; George A. Stryker, Baptisttown; E. D. Leidy, M.D., Baptisttown; George E. Dalrymple, Secretary, Baptisttown.

LAMBERTVILLE CITY.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Gervas Ely, President; Dr. G. H. Larison, I. L. Coryell, W. A. Cole, G. L. Swallow; W. H. Wilmot, Clerk. Post-office address of all, Lambertville.

Water-supply is by a private company organized about ten or twelve years ago. No record of houses using it. Water discolored for a short time after a rain. Has no bad taste, but sometimes, in summer, has a bad odor. Soft enough to be used for all kinds of work.

Reservoir has just been enlarged and cleaned. The supply is obtained from what is known as Swan's creek, and no sewage can enter it, excepting what may come from the farms lying on its borders.

No record of how many houses depend upon wells, but they are very few, as the most of the houses depend upon their cisterns. The Board has no record of the water used at each house.

No sewers. Natural drainage toward the Delaware river.

Streets macadamized and dirt, principally the latter. A systematic plan is now being pursued to do so much macadamizing each year.

Very few houses have basements; almost all, if not all, have good cellars, and the houses are occupied by only one family. No house-to-house inspection has been made this year.

As we have no sewers, cesspools are used, and the contents removed from the premises in air-tight casks by the scavenger, under the direction of the Board.

Board has no record of horses or cows. Hogs are prohibited by ordinance.

Slaughter-houses are not allowed in the city limits.

A rubber reclaiming factory has been built, with not a particularly agreeable odor, but so located as to cause no complaint so far.

Appropriation made every year by the Common Council, who never fail to grant all we ask for. Expenses for the past year about $75.

Measles, scarlet fever and diphtheria have been the prevalent diseases.

The work done has been as follows:

Caused a number of cesspools to be cleaned. Thoroughly quarantined families having contagious diseases. Preventing public funerals of persons dying of any contagious disease. When a case of contagious disease is known to exist in any family, the Board immediately sends the Inspector to put up a card in large letters on the door, announcing the kind of disease there.

W. H. Wilmot,
Clerk.

LEBANON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Hipp, Glen Gardner; Joseph Fritts, Glen Gardner; Andrew C. Cregar, Califon; A. R. Banghart, Secretary, Glen Gardner.

RARITAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. L. Thatcher, President; E. S. Wyckoff, Wilson Moore; A. J. Green, Secretary; John H. Ewing, M.D. Post-office address of all, Flemington.

The water-supply is from springs on the hills west of the town of Flemington and from the South branch of the Raritan. About ten years ago the supply from springs was not sufficient and the branch of the Raritan was used. The water is pumped two miles to a reservoir west of the town. About 200 houses take the water. The water is soft and with no bad taste. It is occasionally discolored during rains. The reservoir is occasionally cleaned. The stream does not receive any sewage above the point of intake for the supply. The stream has never been officially inspected, to the knowledge of the Local Board. Those who do not use the water-supply use cisterns. The water-level is low enough to secure dry cellars. No swamps; no malaria. We have no system of sewerage. There are a few cesspools, but the greater amount of sewerage is carried by private pipes that either empty into a small stream to the west of Flemington or is carried by a system of pipes to the east of the town and spread over a field, the outlet being about 100 yards from the nearest house. These pipes are flushed by surface-water during rains, and the fall is sufficient to keep the pipes clean at all times. No system of ventilation is used. Every house has a cellar used for storage. No yearly house-to-house inspections. No epidemic this year. The slaughter-houses are inspected and every effort made to keep them clean. The Board has passed ordinances. The Board has received a number of complaints of minor nuisances and has ordered them abated.

ANDREW J. GREEN,
Secretary.

READINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Cole, Pleasant Run; D. T. Stryker, White House Station; James Lane, Readington; Dr. W. W. Pursell, White House Station.

It has been generally healthy the past year. Diphtheria has prevailed, of which there were probably twenty-five cases last winter. Three of these proved fatal. The Board has met but once since last year.

D. T. **Stryker**,
Secretary.

TEWKSBURY TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David C. Farley, Secretary, Mountainville; Austin Clark, New Germantown; Hannon Sutton, Califon; Abraham A. Alpaugh, Cokesbury; Henry H. Miller, M.D., Mountainville.

Tewksbury township is situated in the northern part of Hunterdon county; population of about 2,500. Our supply of water is mostly from wells and cisterns, and is generally of a good quality. Very few houses have two families in them. Refuse is generally buried, so that there is no accumulation. Our public schools are well ventilated, and are in good condition. We have four cemeteries in our township. The health of the township has been very good for the past year. No epidemics have prevailed. Malaria quite prevalent, as might be surmised from the contour of the country. Local Health Board passed health ordinances last spring. The Board is in good working order and well organized. Our last meeting was September 12th; up to that date there had not been anything before the Board for consideration.

D. C. **Farley**,
Secretary.

UNION TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

N. B. Boileau, M.D., Jutland; H. A Dalrymple, Pattenburg; Joseph H Exton, High Bridge; Sylvester Taylor, Pittstown; Morris Stockton, Pattenburg.

The health of the township is at present good. No contagious disease of any kind has existed during the year. Our Board is well organized.

Morris Stockton,
Clerk.

WEST AMWELL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. B. Drake, Chairman, Lambertville; R. H. Fisher, Lambertville; Joseph K. Leigh, Lambertville; George E. Van Buskirk, Secretary, Lambertville; Dr. William Radcliff, Woodsville.

MERCER COUNTY.

EAST WINDSOR TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

D. Hart Cunningham, John D. Whittick, Levi Updike. Walter C. Black, Secretary and Assessor. Post-office address of all, Hightstown.

EWING TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John R. Hendrickson, Ewingville; Jacob Maple, Ewingville; James F. Herbert Trenton Junction; Henry L. Cornell, Ewingville.

Water is obtained from springs and wells. No malaria, and cellars mostly dry. We have but very few sewers. Cesspools generally built with open bottoms; cleaned about twice a year; contents carted out upon the land and turned under. No prevalent diseases. No contagious diseases so far this year. The Board has been called upon but twice this year, and in both cases no nuisance could be found.

HAMILTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. George R. Robbins, Hamilton Square; John B. Kirby, Yardville; Richard Hunt, Trenton; David Lee, Hamilton Square. William A. Blake, Assessor, Allentown.

The Board has held two meetings this year to consider the alleged nuisance of the soap-house of O. F. Niedt & Co., situated in Hamilton township. After examining the premises they directed him to procure the most approved method of burning the odors, which having been done, no further complaint has been made. An epidemic of typhoid fever, which caused a number of deaths, raged for a time in Hamilton Square, the cause of which was unknown. At present there are no cases. With this exception the general health of the inhabitants has been good the past year.

HIGHTSTOWN BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Lewis G. Wessler, David Cole, William J. Warrick, J. Walter Pullen. A. M. Taylor, Inspector. Post-office address of all, Hightstown.

Borough of Hightstown contains about 200 acres. Population, 1,800. The water-supply is taken from wells and is of good quality. There is no system of drainage. Some parts of the town are subject to water in the cellars, especially in the spring. We have no malaria and no swamps. Houses all have cellars used for general purposes. We have no large tenement-houses. No yearly house-to-house inspection seems to be necessary. The town has been very healthy during the year. Slaughter-houses have been examined and properly kept. We have received several complaints from our people in reference to the Hightstown canning factory. We recommend better drainage, and the lessees have promised to have the matter attended to next year. We have made the usual inspection of the town and promptly attended to any complaint.

A. M. TAYLOR,
Inspector.

HOPEWELL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. G. Howell, Hopewell; T. R. Voorhees, Harbourton; J. R. Bergen, Pennington. Wm. D. Hill, Assessor, Glenmore.

LAWRENCE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James W. Phillips, Chairman, Trenton; Clark Flock, Lawrence Station; Samuel Van Cleve, Lawrenceville; Isaac B. Baker, Assessor, Lawrence Station; Dr. Edmond Dewitt, Lawrenceville.

PRINCETON BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. E. H. Bergen; J. K. Brown, Inspector; Prof. H. B. Cornwall, A. L. Rowland, J. D. Wolfe; C. E. Seger, Clerk; Prof. W. F. Magie. Address of all, Princeton.

PRINCETON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. E. H. Bergen, H. B. Bayles, E. G. Warren, J. K. Brown, W. M. Wright. Post-office address of all, Princeton.

The Township Board meets regularly the first Monday in each month, and attends promptly to any business that may come before it outside the borough limits.

Dr. E. H. Bergen,
Inspector.

CITY OF TRENTON.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

G. D. W. Vroom, President; Wm. Cloke, Secretary; Thos. S. Chambers, Treasurer; Dr. Cornelius Shepherd, Carroll Robbins, Albert Clayton, Samuel Walker. Alfred W. Packer, Inspector.

The Board of Health of the city of Trenton has labored with zeal, fidelity and success to promote the sanitary welfare of the city during the past year. Its operations embraced a close supervision of every possible source of foulness and ill health. It has accomplished numerous important reforms, abated many nuisances, and successfully grappled with several outbreaks of disease. It has compelled slaughter-houses to lay asphalt floors, and connect with the sewers; improved the sanitary condition of public schools; compelled the correction of much defective plumbing; put a stop to the dumping of garbage in places where it created nuisances; abated the much-complained-of nuisance of the public hay market on West Hanover street, and had it established on North Montgomery street; induced the Police Commissioners to greatly improve the condition of the tramps' lodging-house, which is now one of the cleanest and best managed in the State; persuaded the State authorities to connect the sewerage of the Capitol with the city sewer, and to put a stop to the dumping of foul garbage on the river bank on the State House property; had traps put in a number of sewer openings; brought about the cleaning of numerous alleys, the filling up of sunken lots and the abatement of similar nuisances of a public character; corrected the bad condition of Washington Market, and abated numerous other sanitary evils.

During the year the Health Inspector and his assistant have made 3,374 house inspections; sent 890 notices by mail; served 508 notices in person, and issued 2,394 scavenger permits. There have been 228 cases of diphtheria, 182 cases of scarlet fever, 36 cases of typhoid, 25 of scarlatina and 51 cases of measles. There have also been 53 cases of small-pox. Of these, 4 have proved fatal, 33 have fully recovered, 16 are still sick, from 8 of whom the quarantine will be removed this week. The Board has had chemical analyses made of 23 wells of water by Dr. H. M. Beatty, Analytical Chemist to the Board. Upon examination the water was proven to be totally unfit for domestic use, and the Board ordered the wells closed. The Board also had nine samples of the city drinking-water tested, three by Prof. H. B. Cornwall, the Analytical Chemist of the John C. Green School of Science, College of New Jersey; three by Prof. Clarence L. Spiers, of Rutgers College, New Brunswick, and also three samples by Dr. H. M. Beatty, Chemist of the Board of Health of this city. The nine analyses made by these three chemists—Profs. Cornwall and Spiers and Dr. Beatty—were all nearly uniform in their results with very slight exceptions. The water of the city was by all pronounced good, there being no contamination.

Through the persistent efforts of the Board of Health we have succeeded finally in having a channel cut from the mouth of Petty's run to the river. Before that time it emptied all of its filth on the flats, and for many years it was a bad nuisance. Mr. Anderson, the City Engineer, had a canal cut from the mouth to the river, a distance of between three and four hundred feet, and now it is in a good sanitary condition, better than it has been for the last twenty-five years. There have also been laid about eight miles of sewers and there have been made one thousand house-connections.

WILLIAM CLOKE,
Secretary.

WASHINGTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Coleman, Windsor; Forman Hutchinson, Windsor; Harrison Yard, Robbinsville; Dr. George Silvers, Windsor. G. D. Robbins. Assessor, Windsor.

WEST WINDSOR TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob R. Wicoff, Dutch Neck; D. D. Bergen, Princeton Junction; W. J. Tindell, Edinburg; G. H. Franklin, M. D., Hightstown; S. Judson Allen, Lawrence Station.

MIDDLESEX COUNTY.

CRANBURY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Farr, Cranbury; Sylvanus Grover, Plainsboro; W. Elmer Bergen, Cranbury; Frank A. Brown, Cranbury.

The people depend upon wells almost entirely. Where cisterns are used the water is filtered. A small water-course running through the lots on the west side of Main street in the village of Cranbury was found to be in bad condition. Several closets emptied into the stream, and the fall was such as to cause the water to lie stagnant in several places. The Board immediately notified the owners of such closets that they should be removed from off the stream, and the request was promptly complied with. The Board then had the stream properly cleaned and graded. Only one slaughter-house and that is isolated in the country and is not a nuisance to neighbors. The pumace from the cider-press and distillery was allowed to lie in heaps and decay until it became a nuisance and the Board had to order its removal, which was promptly done. Most of the school-houses have been renovated and repaired during the past summer. The ventilation is not, however, what it should be. Cemeteries are in good condition and properly cared for, except the old Baptist cemetery, which is neglected, but it is so located that no evil can come from it. Our Board has passed no ordinances. Have had no contagious disease. The Board has had two meetings, has carefully considered and inquired into the sanitary condition of the township, and has attended to such matters as have required their attention. General health throughout the township very good.

F. A. Brown,
Assessor.

EAST BRUNSWICK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edwin Allan, New Brunswick; Howard De Hart, Milltown; F. E. Riva, M.D., Milltown; J. W. Bodine, Franklin Park; H. Demison, New Brunswick.

Population about 1,200. Climate, temperate; soil, sandy shale and clay. Houses in good condition. Tenanted by their owners, mostly. Two slaughter-houses. Four school-houses; in good condition. The New Brunswick City Almshouse is situated in the township. Scarlet fever and measles have prevailed to a slight degree. The Board has visited the slaughter-houses and has had no cause to make sanitary improvements.

MADISON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

MONROE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel F. Butcher, Hightstown; James H. Bodine, Prospect Plains; S. C. Young, Jamesburg; Charles G. Hoffman, Jamesburg. J. M. Suydam, M.D., Inspector, Jamesburg.

NEW BRUNSWICK CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry R. Baldwin, M. D, President; A. Vannest Baldwin, Secretary; H. Brewster Willis, Charles H. Voorhees; George J. Litterest, City Clerk; Edward Tindall. Post-office address of all, New Brunswick.

The Board of Health of the city of New Brunswick respectfully reports as follows: There are no markets in our town, but the citizens procure their supplies from the stores. There is no regular inspection of animals by the Health Board. Several of our factories are furnished with fire-escapes. The returns of births are badly reported. The Board of Health of this city has framed and passed to a second reading an ordinance relating to the legalizing of scavengers, and imposing a penalty for infraction of the ordinance. Our sanitary expenses are about $1,000. The past year has furnished no epidemic disease, save measles, which has been widespread, but mild in its nature. The Board has industriously and persistently used disinfection in the public streets and at the corner basins of sewers, and, in fact, in all places emitting foul and offensive odors; and wherever sources of disease have been suspected, energetic measures have been used for their prompt suppression.

A. V. N. BALDWIN,
Inspector.

NORTH BRUNSWICK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John N. Bodine, Franklin Park; H. E. B. Dennison, New Brunswick; Howard S. Dehart, Millburn. Edwin Allen, Assessor, New Brunswick.

PERTH AMBOY CITY.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

PISCATAWAY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alvah Gray, Dunellen; Warren Smalley, Stelton; Firman R. Walker, New Market; Abner S. Coriell, New Market; W. J. Nelson, M.D, New Market.

The prevalent disease of the year has been la grippe. We have had no other epidemic. Our Board has made some sanitary improvements at South Plainfield in opening ditches and drains to facilitate surface-drainage. No other business of importance has been done by the Board during the past year.

W. J. Nelson, M.D.

RARITAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Mr. Moss, Chairman, Metuchen; Luther Tappen, Metuchen; E. W. McGann, Highland Park; A. Clark Hunt, M.D., Metuchen. Theodore A. Wood, Assessor, Metuchen.

The Board has been notified of but one nuisance, namely, the damp condition of the cellar of the public school. The cellar has since been thoroughly underdrained and cemented.

SAYREVILLE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Lefferts Smith, Assessor; John S. Heston, J. N. Blair, Eugene Forman, J. H. Beekman, M.D. A. L. Rue, Inspector. Post-office address of all, Sayreville.

The general health of the township is good. There has not been as much malarial fever as in former years, and no epidemic of any kind. Some small nuisances were reported to the Board, and these were immediately removed.

J. H. BEEKMAN, M.D.

SOUTH AMBOY BOROUGH.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

D. C. Chase, President; John Scully, Ward C. Perrine, Patrick Campion, Stephen Martin, J. H. Green. E. E. Haines, M.D., Inspector.

Population of the borough, 4,000. The surface-water runs naturally to the bay. The Board has made great improvement in the streets, so that the natural flow is not obstructed. Very little fever is ever reported. Houses mostly have cellars, used for storage. We have only two blocks of sewers. Very few houses connect with them. No prevalent diseases this year. We have three slaughter-houses, and they are kept in the best of order. A great many improvements have been instituted during the past year.

A. V. APPLEGATE,
Assessor.

SOUTH BRUNSWICK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Mount, Kingston; D. C. Griggs, Dayton; A. D. Butler, Plainsboro; F. G. Stevenson, Assessor, Dayton; Edgar Carroll, M.D., Dayton.

We have nothing new to report, as everything in the township seems to be in good condition. There have been no contagious diseases and no complaints of any kind.

F. G. STEVENSON,
Assessor.

WOODBRIDGE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. D. Brown, President; Jonas H. Coddington, Franklin Moore, S. Harned. All of Woodbridge.

MONMOUTH COUNTY.

ASBURY PARK.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William D. Pennypacker, President; J. A. Bradley, David Harvey, Jr., E. F. Appleby, John Rockafeller, N. E. Buchanon. E. Wright, Inspector. P. L. Lippencott, Assistant Inspector. Randolph Ross, Clerk. Henry L. Ogden, Chemist. H. Mitchell, M.D., Advising Physician. Post-office address of all, Asbury Park.

Asbury Park is located on the Atlantic coast, about two miles south of Elberon, and is separated from Ocean Grove, on the south, by Wesley lake. The climate in summer is much cooler than in inland cities, and averages much warmer in winter. Our population varies so that an exact census can scarcely be given, but if a monthly census was taken during the year of the permanent and transient population and divided by twelve, it would make our population average over 15,000. The public artesian water-supply has been satisfactory both in quantity and quality, as our late analysis has proved. There have been 81 water connections made this year, making a total of 825. The water from 112 surface wells has been analyzed this season, 26 of which were found polluted and ordered closed. During the past year we have taken the water-level at different points throughout the borough, and had a map made showing the depth below the curb of the water at all the given points, thus giving us a guide as to how deep a builder at a given point can dig a cellar with safety from dampness. The sewers have continued to do their work satisfactorily; no annoyance has been caused by them. During the year 22 connections have been made, making a total of 805. The contract for the removal of garbage and refuse amounted to $2,790. The contractors have given good service, causing but few complaints. The usual work of inspecting the premises has been continued. Two additional Inspectors were employed from June 1st until the close of the summer, during which time several house-to-house inspections were made, also new diagrams, with the required remarks, have been entered upon our street-books, showing the condition of all premises in our borough. These books are open to the public. The borough is well lighted by electricity. Little or no annoyance is given by the plumbers, as they have learned our requirements, and therefore inferior plumbing is a thing of the past. Fifty-two plans of plumbing-work have been examined, tested and approved during the year. Twenty-four samples of milk were analyzed, only one of which was found to contain less than 12 per cent. of solids. Eighteen samples of oil were analyzed, all of which stood the required test. Nine cases of contagious diseases have been reported, *i. e.* five cases of scarlet fever, two cases of measles, one case of diphtheria and one case of typhoid fever (which was imported, the patient being sick upon arriving here). No deaths have occurred from contagious diseases. Of the fifty-four deaths recorded during the year ending October 1st, 1891, twenty-nine were of transient visitors and twenty-five of the resident population.

WILLIAM D. PENNYPACKER,
President.

ATLANTIC HIGHLANDS.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Rev. Dr. Edward C. Curtis, President; Dr. John H. Van Marter, Dr. George D. Fay, Dr. H. A. Clark, Jacob S. Stout, John B. Givan; James H. Leonard, Secretary; John B. Swan, Inspector. Post-office address of all, Atlantic Highlands.

Located on Sandy Hook bay, from 10 to 150 feet above the ocean level, sloping gradually toward the west and south. The borough covers between 500 and 600 acres. Water is taken from wells, and is of a very good quality except in a few instances where a well is located in a vein of black marl. On the western boundaries the best of water can be obtained from springs running from the hills. A reservoir located on these hills would furnish every house in town with a water-supply, and the matter is now under consideration. Cesspools are now used, but, as there is constant trouble on account of leakage from them and they are often overflowing, a system of sewerage will no doubt be introduced at an early day. A committee has already been appointed by the Board of Trade to gather the necessary information. Streets are fifty feet in width, except some important ones, which are from sixty to one hundred feet. About one-quarter of our houses are occupied and owned by residents in New York City, who reside here from four to six months in each year.

Some few remain the year round, as the railroad communication is much improved. Garbage is removed by persons employed for that purpose. There is but one school building, accommodating about two hundred. Other accommodation will have to be found at an early day. A large cemetery is located just a short distance from the borough limit. The Board of Health has experienced some difficulty in fully carrying out the health laws. Measles at the commencement of the year were prevalent, and a few cases of whooping-cough. This is considered a very healthy locality. The Board of Health has taken pains to have the town kept in a healthy condition as far as possible, by having every cesspool constructed according to the ordinance. Have had property drained so as to prevent standing pools of water. Have removed dead animals, have had cesspools and privies cleaned with as little offense to the citizens as possible, but there is still room for activity in many directions.

JAMES H. LEONARD,
Secretary.

ATLANTIC TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

BELMAR.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James S. Huyler, President; C S. Wolverton, Joab Titus, William M. Bergen, C. G. Clayton, F. B. Philbrick, W. L. Kinmouth. C. S. Wolverton, Inspector. Post-office address of all, Belmar.

Permanent population, 700 or 800. Summer not estimated. Part of borough is sewered into the Atlantic ocean. Water-level is generally such as to secure dry cellars, except in the rainy season. No swamps and no malaria. A majority of the houses have cellars. The sewer system has been working about a year and there are only a few connections as yet made with it. Cesspools are supposed to be cemented tightly. They are emptied by scavengers and contents taken outside the borough.

EATONTOWN TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. E. Corliss, Ocean Port; D. Vannote, West Long Branch; R. F. Hopper, Eatontown; W. R. Stevens, Secretary, Eatontown.

The growth of our township is slow, and there being no massing of people in cities, towns or boroughs, we are, consequently, free from epidemic diseases. We have had a few complaints regarding nuisances, which have been promptly abated. We have had a few scattering cases of scarlet fever, some followed by diphtheria, but in a comparatively mild form, and no deaths have occurred from these diseases. There is a neglect upon the part of physicians practicing in our township in regard to reporting cases of contagious disease. I propose to have the ordinance enforced or repealed in the near future. The population of the township is about 2,800. I do not think fifty per cent. of our population have been vaccinated, and the measure is rarely recommended by our physicians. Many people are strongly opposed to it, but were small-pox to appear we should vaccinate through the schools or forbid attendance by those not protected.

E. W. Crater, M.D.,
Inspector.

FREEHOLD TOWN.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Bawden, Aaron C. Hart, O. R. Freeman, M. D., J. O. Burke, Jr., John Enright, Theodore Fields. William J. McClure, Inspector. Post-office address of all, Freehold.

Our water-supply has proved a success. The introduction into the houses is very gradual, about 160 to 175 connections having been made with the main. The water is occasionally discolored. Some sanitary improvements have been made about the county buildings, the jail in particular. The graded-school grounds have been extended, affording more play room. The general state of health has been good, and there have been no epidemic diseases.

W. J. McClure,
Inspector.

HOLMDEL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James W. Hoff, William Morrell, Van Dike Polhemus; Aaron Longstreet, Secretary. Henry D. Cook, M.D., Inspector. Post-office address of all, Holmdel.

Holmdel township is situated in the north part of Monmouth county. The land is generally level and used wholly for agricultural purposes, some of the best marl-bottom farms in the county being in the township. There is but one cemetery, which is kept in good condition. There has been no contagious disease prevalent during the last year, and the Board of Health had no complaints of any kind brought to their notice.

AARON LONGSTREET,
President.

HOWELL TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. S. M. Disbrow, Farmingdale; Jacob Lutz, Farmingdale; Charles Lafetra, Squankum; Charles Donahay, Turkey; James H. Butcher, Ardena.

The Township Board have held regular meetings and all matters referred to us have been arranged and cleared up.

JAMES H. BUTCHER,
Secretary.

LONG BRANCH CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Brown, Jr., M.D., James P. Connelly, J. W. Taylor, M.D., William J. Smyth, Jr., J. Goldey, N. N. Pemberton, M.D., E. B. Blaisdell, Hugh R. Herbert. Post-office address of all, Long Branch.

Public water-supply is by private company. Majority use wells. The Health Board has no list of houses that do not use the public supply. A portion of the city is sewered. Cellars are generally dry except a few in very wet seasons. About twelve tenement-houses have more than two families. We do not have a yearly house-to-house inspection. About one-tenth of the houses are connected with the sewer. We have no record of sewer connections. A number of cesspools are used, with cemented bottoms and sides. They are emptied with odorless excavators and the contents are carried out of town for fertilizing purposes. No prevalent diseases this year. No slaughter-houses. The Health Board has had charge of the garbage this year and had it carted out of the town during the summer months, and had everything done that was possible to make the place in a healthy condition. The Sanitary Inspector does all in his power to keep everything in good shape. Our Sanitary Committee have also made many investigations and suggested improvements, which in most cases have been made.

MANALAPAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William H. Reid, Chairman, Tennent; David L. Applegate, Tennent; Daniel S. Aumack, Englishtown. S. Craig Brown, Assessor, Englishtown. Asher T. Applegate, Physician, Englishtown.

MARLBORO TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. Carson, Holmdel; P. C. Vanderveer, Wickatunk; Tennent Quackenbush, Wickatunk.

MATAWAN BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. William Maggs, President; Peter C. Disbrow, Inspector; Dr. Cyrus Knecht; William Rodgers, Secretary; William Hardwick, Isaac W. Bedle, William A. Fountain. Post-office address of all, Matawan.

The Board and Inspector have used every precaution against any cause for epidemic or disease of any kind. They have ordered dead animals buried. Pigs removed out of the borough and pens cleaned. Have also ordered cesspools and sewers cleaned and water-closets moved and cleaned. The carting of night-soil and other offensive fertilizers through the borough, when it would be an injury to the public health, has been prohibited.

MATAWAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Lisk, President; Charles E. Close, Edward Tarry; Francis C. Bedle, Assessor; William Rodgers. Dr. C. Knecht, Inspector. Post-office address of all, Matawan.

Every officer does his duty and the township is in a good, healthy condition. No disease of a prevalent or dangerous nature exists and no cause for any, as everything is carefully watched by the Board.

MIDDLETOWN TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Swan, Atlantic Highlands; R S Snyder, Atlantic Highlands; H. A. Hendrickson, M.D., Atlantic Highlands; J. H. Van Mater, M.D., Atlantic Highlands; Geo Morford, New Monmouth.

MILLSTONE TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hon. George J. Ely, Perrineville; George Hartman, Perrineville; Albert Thompson, Clarksburg; Curtis Foreman, Clarksburg; William T. MacMillan, M.D., Perrineville

Farming is the leading industry in this section. The greater part of the township consists of rolling land and good drainage, and the absence of ponds and swamps makes the township remarkably free from any prevailing disease. The school-houses are well taken care of. Cemeteries are in good condition. Slaughter-houses situated in the township are well kept. The township has been remarkably free from any contagious diseases the past year. Some twenty-eight cases of pneumonia occurred in the southern part of the township during March and April. During July and August some sixteen cases of dysentery were reported to the Inspector. The sanitary condition of the township is good, the people recognizing the importance of pure air and water and of clean surroundings.

GEORGE J. ELY,
Secretary.

NEPTUNE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

S. W. Kirkbride, Asbury Park; Dr. A. Williamson, Asbury Park; L. E. Watson, Asbury Park; Lewis Ramearn Ocean Grove; J. Newman, Avon.

Neptune township has been very healthy for the last season. Last fall there were three cases of typhoid fever and three of diphtheria reported to the Board. This season only two cases of diphtheria have been reported so far. Our Assistant Inspector has made a very thorough inspection of the township. The lowlands west of Asbury Park and Ocean Grove are being drained, which is a great improvement. West Park is soon to have a water-supply from springs, which it is hoped will be very satisfactory.

L. E. WATSON,
Clerk.

OCEAN GROVE.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Rev. E. H. Stokes, D.D., President, Ocean Grove; Rev. A. E. Ballard, Ocean Grove; Hon. James L. Hayes, Newark; Hon. Holmes W. Murphy, Freehold. J. H. Alday, M.D., Inspector, Ocean Grove.

The sanitary condition of Ocean Grove is excellent. We have had a remarkably healthy summer, notwithstanding the presence of several contagious diseases in our midst, the subjects of which were strangers visiting the place. Yet because of the healthy sanitary condition of the town, in connection with the rigid quarantine of the sick and a thorough disinfection of the premises, these diseases were confined to the narrow limits of their first appearance, and thus prevented from spreading. The early spring inspection of the town, the cleansing and disinfection of the homes of the people and their surroundings, with the necessary instruction in proper sanitation given to the occupants thereof, is self-evidently a wise and important proceeding, for thereby the town is put in a safe and healthy sanitary condition, preparing it for the influx of the multitudes of the summer season, and also exempting it from being the receptacle of disease. We regard our sewer system as being commensurate with the requirements of the town. It embraces, with its mains and laterals, about thirteen miles, all of which convey the sewage matter into one large main pipe, which extends into the ocean five hundred feet, at which point it discharges its contents. This main pipe is covered and protected with a most substantial and ornate pier, extending out into the ocean five hundred feet, thereby preserving and protecting it from being injured by the winter storms and wreckage matter. Our artesian water system, with its mains and laterals, covers at least thirteen miles, furnishing as pure water as can be obtained. The Board is continually on the alert, making and enforcing all needful ordinances for the proper sanitation of the town, especially in reference to the connection of all premises with the sewer and water systems. In the last six months there have been 33 sewer connections and 38 water connections made. This makes in all to October 1st, 965 sewer connections and 952 water connections. In conclusion, I may add that at this date Ocean Grove is very healthy, and its sanitary condition carefully guarded.

J. H. ALDAY, M.D.,
Inspector.

OCEAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas R. Wooley, Long Branch; Levi G. Irvin, Seabright; James Daugh, Deal; Howard A. Branley, Clerk, Long Branch. George W. Brown, M.D., Inspector.

The boroughs of Long Branch and Seabright cover such a large portion of our township that our Board has had very little work to do the past year, consequently I have nothing of interest to report.

HOWARD H. BRANLEY,
Inspector.

RARITAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. S. R. Brown, John W. Keough, Asbury Walling. T. V. Arrowsmith, Assessor. Address of all, Keyport.

SHREWSBURY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Wm. Koeng, M D., President, Red Bank; Charles B. Parsons, Red Bank; William Tabor Parker, Little Silver; Thomas Brown, Red Bank; Borden Hance, Red Bank. William Henry Smith, Inspector.

We frequently find houses in an unsanitary condition on account of the neglect of owners. The Board has kept strict watch over all refuse, and excreta, and matters have been wonderfully improved. A few cases of hog cholera have occurred. Slaughter-houses have been kept in good condition, owing to the close scrutiny of this Board. I think that both the Fair Haven and especially the Oceanic school should be in a better condition. Water-closets of both are extremely bad. The physicians are somewhat neglectful in sending in reports, but the Board has been more exact in reference to this matter during the past year. Ten cases of scarlet fever occurred during the year. Each member of the Board has considered it his duty to help to keep the good health of the public. Whenever complaints were made, both the Inspector and the physician would see that everything was made right. Every person is satisfied with our work, and that is sufficient proof that we have done our duty.

THOMAS BROWN,
Assessor

UPPER FREEHOLD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles C. Wyckoff, Allentown; I. S. Dawes, Imlaystown; Edward Hyers, Red Valley; Thomas Quicksell, Assessor, Hornerstown; F. C. Price, M. D. Imlaystown.

Wells furnish the water-supply. Laws and regulations are well observed by this Board. La grippe and influenza were very prevalent in their season. German measles were prevalent in May and June. Seven cases of scarlet fever, with no deaths, occurred in the autumn. We have had several cases of typhoid fever in the township. Have had some continued fevers of a malarial type since August.

WALL TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James L. Allgor, New Bedford; P. F. Philbrick, Belmar; Henry Wainwright; Brielle; John M. Allen, Manasquan; Dr. A. A. Higgins, Manasquan. John M. Allen, Inspector, Manasquan.

The Board has had regular monthly meetings. The Inspector has closely watched for any nuisance, and at its first appearance had it abated. The people are willing to comply with the requirements of the law when they become acquainted with them. The health of the township has been fairly good during the past year. A few cases of dysentery and typhoid fever have occurred. The Board has had no aggravated cases to deal with.

JOHN M. ALLEN,
Secretary.

MORRIS COUNTY.

BOONTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Horace Ford, Ellis G. Myers, Thomas Bayard; Gilbert D. Evans, Clerk. Joseph Steventon, Assessor. Post-office address of all, Boonton.

As nine-tenths of the township is within the corporation limits of the city of Boonton, and there being so little to do, our Board has never organized.

JOSEPH STEVENTON.
Assessor.

CHATHAM TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dayton Baldwin, New Providence; Eugene Hopping, Afton; George S. McDougal, Chatham; Edward P. Miller, Chatham; W. J. Wolf, M D., Chatham.

Since the incorporation of the town of Madison the township contains three towns—Chatham, Stanley and Afton. The eastern part of the township is the beginning of the flooded meadows of the Passaic valley. The balance of the township is high and dry and very healthful, including Long hill, which rises abruptly at Chatham to an elevation of 300 feet, and forms the left bank of the Passaic. The Board passed an ordinance relating to nuisances, imposing a fine of $25 upon any person or persons who allow any waste-water from sinks, closets, cesspools or privies to run into any street, alley or public place. Similar sections were passed imposing fines for the commission of various similar nuisances. A number of complaints coming under the sections of this ordinance were made during the year and were promptly abated upon notice. It was not found necessary to impose the fine in any instance. The most important matter for this Board of Health to look after is the emptying of sewage into the Passaic by the town of Summit. For the past four years a private sewer has been allowed to empty into the mill-pond of the Franklin flour-mill at Stanley. This sewer has simply been allowed to pour its contents, solid and liquid, into this mill-pond, without any attempt at filtration, until it has become one gigantic cesspool, and during the latter months of summer and in early autumn, whenever the pond is drawn low, leaving much of the surface uncovered and seething under the sun, there arises a stench the effects of which can result in nothing but the direst disease. The foulness of the water may be imagined when I state that on a hot day in August last, when the water in this mill-pond was drawn very low, the Inspector saw bushels of dead fish in the pond at this point. Thus far nothing has been done by the Summit Township Board of Health to stop this private sewer, much less to cleanse the pond, which it should force the owner to do. The Chatham Township Board have strongly urged these facts upon the attention of the Summit Township Board. Thanks to an enterprising public, a new and extensive public sewer is being constructed, with a filtration system. The objection, if any, to this is that the filtration plant is situated so as to empty the filtrate into the river, above all the mill-ponds, four in number.

CHESTER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Elias M. Patrey, President; Charles H. Ming, Treasurer; Spafford H. Leek; *Henry P. Drake, Assessor; W. A. Green, M.D., Secretary. Post-office address of all, Chester.

The past year has been one of unusual health. During the spring we had an epidemic of rubeola in a very light form, and a few cases of scarlet fever. In July and August we had an epidemic of whooping-cough, unusually severe. Whether the long dry spell that preceded its outbreak had anything to do with it or not I am not prepared to say, although I am inclined to believe it was a factor in the case. Within the past two weeks, several cases of diphtheria have developed. The first case was a little boy ten years of age, who came from Trenton on a visit. He was here several days before he was taken ill, and during that time he played with quite a number of children here, but as yet none that he was with have contracted the disease. The case was a severe one and he only lived about three days. The other cases are widely separated from each other, and therefore could not depend upon a common local cause. No diseases of animals have been reported. What few complaints there were of nuisances were quickly disposed of in a satisfactory manner.

W. A. GREEN, M.D.,
Inspector.

HANOVER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. E. P. Cooper, Troy Hills; George W. Bates, Morris Plains; Walter H. Mitchell, Whippany; George Cook, Hanover. Joseph H. Bastedo, Assessor, Boonton.

Water-supply from wells and cisterns; public health is good. There have been no prevalent diseases. There has been no occasion for the Board to act. Where nuisances have existed a notification from the Board is always effective.

JOSEPH H. BASTEDO,
Assessor.

JEFFERSON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dennis M. Duffy, Woodport; Charles H. Jennings, Milton; Jacob Tallman, Oak Ridge; S. Utter, M.D., Woodport.

This township is situated in the mountains of the northern part of Morris county. Water-supply from springs and wells. There have been a few cases of whooping-cough in the township during the past year. No general epidemic. Health Board has little to do. Reports of vital statistics are returned regularly every thirty days.

S. UTTER, M.D.,
Assessor.

MADISON BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. C. Anderson, Dr. J. N. Vandewater, Henry M. Sacks, William S. Brown, Samuel Brant. F. E. Day, Inspector. Post-office address of all, Madison.

Population 2,000; sand and gravel soil; ground high and rolling. Water-supply from a well thirty by thirty-two feet, pumped to a stand-pipe seventy-five feet high. Pressure at the center of the town eighty-five pounds to the square inch. Capacity of well 1,000,000 gallons daily. Consumers to date number eighty-five. Nine miles of pipe. No sewerage system. No swamps and no malaria. Roads gravel and in good condition. Few tenements. Cesspools emptied on farms outside borough limits. No slaughter-houses. Rose culture is the principal industry. All nuisances complained of are inspected and notification is immediately forwarded to abate them. These are generally complied with.

F. E. DAY,
Inspector.

MENDHAM TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John S. Stiger, M.D , M. Robinson, J. W. Swackhammer, F. H. Garabrant. Post-office address of all, Mendham.

Mendham is a very healthy country town situated in the hills of Morris county. There is no necessity for a system of sewers, as the country is descending in all directions. There are no slaughter-houses to amount to anything. No stagnant water or marshes to generate disease and mosquitoes. We have no contagious diseases.

M. ROBINSON,
Chairman.

MONTVILLE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Husk, Montville; John H. Capstick, Montville; Walter A. Young, Boonton. J. H. Van Duyne, Assessor, Montville.

MORRISTOWN CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James P. Sullivan, President; Stephen Breese, Secretary; Robert C. Walsh, H. A. Freeman, A. L. Revere, James Douglas, M.D. Daniel H. Leek, Inspector. Post-office address of all, Morristown.

Population is about 9,000. An intervening range of hills cuts off the worst effect of easterly winds from the sea. The climate is considered very favorable to persons affected with throat and lung troubles. Water is collected from springs on surrounding hills into reservoirs, which are all on high levels. One spring, known as the Sand spring, is on rather low ground, requiring pumping to the distributing reservoir in the city. The supply is abundant for all ordinary uses. There are only three or four wells now in use for drinking purposes. There is no sewerage system, cesspools and vaults being used. Refuse, ashes, &c., are removed at private contract by scavengers. Excreta are carried outside the city limits by odorless excavators and there mixed with sand. All public school buildings are of brick, comparatively new and well arranged as to sanitary matters. Very few burials are now made in the city; permits for burial are issued by the Secretary of the Board of Health. No slaughter-houses or abattoirs in the city limits. Some years ago the Board of Health established a code of regulations, concerning all matters of public health, which is rigidly enforced. Any cases of contagious disease are at once reported by the physician in charge and the Health Inspector sees that proper care is taken. This city has been quite free from diseases of a contagious nature during the past year, except a few cases of diphtheria, cerebro-spinal meningitis and typhoid fever, due in some instances to local causes. Steps to do away with these were immediately taken. The Board of Health meets every month for the transaction of whatever business may come before it and to hear the reports of the Health Physician and Inspector. The latter is now engaged in making a complete inspection and report of the sanitary condition of every building in the city, the same being recorded in a book gotten up for the purpose and which will serve as a permanent record and will be open to the inspection of any one wishing information on the subject. The Inspector has been provided with a neat badge to wear while engaged in his official duties. A considerable number of written notices to abate nuisances have been served during the year by the Inspector, in most instances with good effect, though in one or two cases legal measures have been resorted to with good result.

MOUNT OLIVE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Benjamin A. Howell, Chairman, Flanders; Samuel S. Wills, Treasurer, Stanhope; W L Thomas, Draketown; Dr. C. N. Miller, Physician, Flanders; A. H. Bartley, Recorder, Bartley.

Health of the township generally good. No prevalent diseases during the year. No complaints have come before the Board except complaint of the drainage from the kitchen of the Forest House, at Budd's Lake. That the Board may be able to abate such nuisances and any others detrimental to the health of the inhabitants, a set of ordinances has been adopted, which will hereafter be enforced.

B. A. HOWELL,
Chairman.

PASSAIC TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Andrew S. Bird, Long Hill; Jacob T. Ogden, New Vernon; J. Frank Miller, New Vernon; F. Leo Hendrickson, Madison.

Our township enjoys a good degree of health. The water-supply from wells and springs is satisfactory. There has been no particular disease within a year.

F. Leo Hendrickson.

PEQUANNOCK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Albert Van Voorhees, Pompton Plains; B C. Demarest, Pompton Plains; T. Lincoln, Lincoln Park; F. L. Levi, Butler; J. Rogers, Butler.

Water-supply from wells; soft in character. Cellars usually dry. There are three or four houses with more than two tenants. Slaughter-houses are so far out from the town that they are not troublesome. There have been no complaints made to the Board.

J. Rogers,
Assessor.

RANDOLPH TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. L. Hedden, Dover; John Downey, Port Oram; F. M. Headden, Dover; Isaac Hance, Dover.

ROCKAWAY TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James B. Tonking, Chairman, Mount Hope; Edward Fox, Rockaway; M. Hoagland, Rockaway. C. L. Beach, Assessor, Rockaway.

The township is in a very healthy condition, and there is nothing special to report.

C. L. Beach,
Assessor.

ROXBURY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

WASHINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Steward Neighbor, German Valley; Henry Wiley, Drakestown; Elijah Dufford, Middle Valley; Philip Schuyler, Naughright. Elmer E. Hoffman, Assessor, Middle Valley. Edward Sutton, M.D , Inspector, Middle Valley.

The main water-supply is from wells and springs, generally salt and with a slight iron taste. The drainage is natural. Swamps and malaria quite frequent. The prevailing disease this year was measles. Slaughter-houses are inspected. The Board has passed no ordinances. The mill-dam at Naughright during last winter's freshet was washed away and remained until this last summer without being repaired, when a complaint was made to the Health Physician. He made an inspection and found that it was necessary to repair it at once to prevent vegetable decomposition. The Board by prompt action was able to effect this result without any delay. The Board takes an active interest in the sanitary condition of our township.

ELMER E. HOFFMAN,
Secretary.

OCEAN COUNTY.

BERKELEY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

BRICK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Luke Johnson, Lakewood; C. C. Pearce, Burrsville; John L. Darsett, Point Pleasant. A. W. Downey, Assessor, Burrsville.

DOVER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Adolph Ernst, Chairman, Toms River; James J. McKelvey, Toms River; John Tilton, Toms River; A. V. Irons, Clerk, Toms River.

Number of inhabitants, 2,000. Climate is good. Water-supply by wells and springs. No sewer system. No swamps near the town. All slaughter-houses have been inspected by the Board and found in good condition. All school-houses have been inspected and found satisfactory. Jail has also been inspected; found everything in good shape. No ordinances have been passed. The Board has made personal investigation of various matters, and all persons who have been notified of any neglect have taken prompt action.

A. V. Irons,
Clerk.

EAGLESWOOD TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. McCunney, F. A. Hardt, S. Ashhurst, M.D., R. B. Engle. Post-office address of all, Beach Haven.

JACKSON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Johnson Biles, Vanhiseville; Joseph S. Clayton, Jackson Mills; Harrie Applegate, Bennett's Mills; Wright De Bow, Clarksburg.

LACEY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. O. A. Wood, Forked River; A. G. Wilber, Forked River; B. F. Mathews, Forked River; B. F. Holmes, Forked River; T. C. Van Arsdale, Cedar Creek.

The water-supply is from running streams, springs and wells. The water from wells here, when cleaned, is very healthy as a rule, but it is to be feared that many wells become foul from toads and vermin, and thus become sources of disease. The natural drainage is good, and very little stagnant water remains on the surface. Much more care is used than formerly to destroy and bury refuse. Disease among animals occurred on one farm. A call on the State Board of Health was promptly responded to, and the disease was quickly stamped out. Our Board of Health is completely organized, and always ready for action. A health code was passed about four years ago, and a number of copies printed. Each year the same code is re-adopted, and copies posted in the most public places. Some years ago it was the common practice to throw dead fish and other refuse in the streams used for water-supply, but the Board took a decided stand against it, and now we are happy to say this and some other nuisances have been abated.

B. F. MATHEWS.

LITTLE EGG HARBOR TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob L. Cowperthwait, President; C. M. Berry, Eph. Berry, Alex. Cowperthwaite, Theophilus T. Price, M.D., Secretary. Post-office address of all, Tuckerton.

The climate and soil are exceedingly healthy, and there is but little necessity for sanitary regulation or official interference. The Board of Health has little else to do in an official capacity, except to organize.

T. T. PRICE,
Secretary.

MANCHESTER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Michael McCallion, William Montgomery, Curlis Wilbur, T. Dowd, Jr. Post-office address of all, Manchester.

There is no prevalent disease in the township this year. Our streets have been improved since last year. In other respects our town remains about the same.

T. DOWD, JR.,
Assessor.

OCEAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Gray, Wyckoff Letts. J. H. Wilkins, Assessor. Post-office address of all, Waretown.

Drainage very good, but room for improvement. Most of the houses have cellars. No contagious diseases during the year. I am sorry to say that our Board of Health has never regularly organized.

J. H. WILKINS,
Assessor.

PLUMSTEAD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Louis J. Davis, W. S. Chapey, William B. Coward. Aaron S. Bronson, Assessor. Howard Allen, M.D., Inspector. Post-office address of all, New Egypt.

Each dwelling has its well of water. The refuse and excreta are carted away by farmers. No infectious disease of animals. Two slaughter-houses in the village, but no bad effects from them. No cemeteries in New Egypt. Three school-houses in the township. There have been a few cases of typhoid fever and diphtheria.

STAFFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles H. Cranmer, Manahawkin; John Letts, Manahawkin; Lewis A. Cranmer, Mayeta; Samuel B. Irwin, M.D., Manahawkin; John B. Courtney, Manahawkin.

The township has a scattered population. No yearly house-to-house inspection. Cesspools with open bottoms and sides are used. No particular disease of animals. One slaughter-house; in good condition. Four cemeteries in the township. Have not passed any health ordinances. Some malarial fever and scarlet fever have existed. But little investigation has been necessary.

UNION TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph A. Pharo, George H. Vannotte, Ira S. Cranmer, Dr. Edmund Bennett, E. R. Wills. Post-office address of all, Barnegat.

PASSAIC COUNTY.

ACQUACKANONK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

LITTLE FALLS TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Crane, Chairman; Eugene Shire, David Hawthorne. Walter Bott, Assessor. E. A. Keeler, M.D., Inspector. Post-office address of all, Little Falls.

Water-supply from wells and cisterns. Cesspools usually have open bottoms and sides; seldom emptied. No prevalent diseases among cattle. Slaughter-houses frequently inspected. Three public schools in the township. The Board has held monthly meetings to hear complaints. Complaints have been few and nuisances easily abated.

MANCHESTER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Doras W. Warren, Jr., Hawthorn; S. Cyrus Townsend, M.D., Paterson; George Van Houten, Paterson; John Reinhardt, Paterson; William D. Berdan, Secretary, Paterson.

Cesspools are built in various ways, some with open bottoms and sides, others are cemented. There are eight houses in the township of more than two families. We have no yearly house-to-house inspection. In the months of May and June measles were quite prevalent through the township. In the month of August there were five cases of diphtheria and one death therefrom. There have been five or six cases of scarlet fever during the year, one of which proved fatal. Chicken-pox in a light form existed in the township in September. At present the health of the inhabitants of the township is good. There are no slaughter-houses in the township. There has been a fat-rendering establishment started in the township within the last year. There was a complaint made to the Board about the offensive odor arising therefrom; the proprietor was ordered to abate the nuisance, which he promised to do, and we have had no further complaints against the establishment. A notice was served on the Jewish Cemetery Association to have the graves dug as deep as the law required or suffer the penalty. The Board has brought to account those dumping offal and garbage in various places in the township, and also are endeavoring to secure the names of all those who have died in the township each month.

WILLIAM D. BERDAN,
Secretary.

PATERSON CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theo. Y. Kinne, M D, President; Philander A. Harris, M.D., Frank E. Agnew, M.D., B. C. Magennis, M.D., James Mills, Esq., John T. Pollitt. J. L. Leal, M.D., Inspector and Secretary. Post-office address of all, Paterson.

I think the questions for the annual report can be answered best by forwarding a copy of our last annual report.

J. L. LEAL, M.D.,
Inspector.

[NOTE BY SECRETARY OF STATE BOARD.—We select from this report as follows, because here we have a showing of active and efficient work, which, although needing to be greatly extended, will serve as a guide or comparison for other cities.]

Condensed statement of contagious diseases reported to this Board for year beginning March 1st, 1890, and ending March 1st, 1891:

Scarlet fever	253 cases,	11 deaths.
Diphtheria	321 "	106 "
Typhoid fever	69 "	18 "
Small-pox	1 case,	no death.

Number of permits to attend school issued to children from premises where contagious diseases have existed	228
Number of premises where contagious diseases have existed, fumigated and disinfected	445

NUISANCES, COMPLAINTS AND INSPECTIONS.

Complaints of nuisances and violations of health laws made to this Board	835

NOTE.—All of these complaints have been investigated and proper steps taken to abate nuisances and secure obedience to health laws.

Complaints well founded and nuisances existing	733
Nuisances abated and grounds of complaint removed	625

NOTE.—Of those not abated, the greater proportion are either in the process of abatement or laid over until the weather permits the necessary work to be done.

Inspections of premises made	1,489
Number of notices served	785
Scavenger permits issued	1,033
Complaints made before the Recorder	14
Pursued to a successful termination	11

Licenses Granted.

During last fiscal year licenses were granted as follows:

Licenses to keep cows	11
Licenses to scavengers	2
License to Paterson Sanitary Co.	1
License to cut ice within city limits	1
Licenses to sell ice within the city limits	7
Licenses to manufacture and sell artificial ice	4

Licenses previously granted which are still in effect:

Licenses to keep domestic animals	787
Licenses to maintain slaughter-houses	2
Licenses to maintain glue factories	2
License to maintain feather-cleaning works	1
License to maintain smoke-house	1

Work accomplished during fiscal year with relation to the construction, plumbing and drainage of buildings:

Total number of permits granted	1,290
(*a*) For new buildings	374
(*b*) Extensions	916

Inspections	3,816
(a) Final inspections	963
Number of complaints of old plumbing systems investigated	76
Number of old plumbing systems condemned	57
Total number of sewer connections made	543
(a) For old buildings	341
(b) For new buildings	202
Total number of feet of earthen and cement pipe used	48,300
Total number of feet of cast-iron soil and waste-pipe used	61,600
Total number of plumbers registered	60

Markets and Foods.

Work accomplished during fiscal year as regards markets and foods.

During year there was condemned, seized and destroyed the following amount of food-stuffs:

MEATS.

"Bob" veal	24 carcasses.	Hams	100 lbs.
Beef	1,165 lbs.	Sausage	40 "
Corned beef	975 "	Pigs' feet	60 "
Beef livers	13	Mutton	235 "
Pork	1,435 lbs.	Lamb	85 "

FOWLS.

Turkeys	7	Chickens	25 pairs.

GAME.

Rabbits	21 pairs.

FISH.

Fish	6 barrels.	Clams	1 barrel.

EGGS.

Eggs	105 dozen.

BUTTER.

Butter	1 tub.

VEGETABLES.

Vegetables	6 barrels.

FRUITS.

Watermelons	200	Tomatoes	2 crates.
Fruit	2 lots.		

Report of the Treasurer

Of the Board of Health, City of Paterson, for the year ending with March 20th, 1891.

1890.	
March 21st. Balance of cash on hand	$187 47

1890 and 1891.		
Received of Treasurer city of Paterson	$3,500 00	
Received for plumbing permits during the past year, twelve hundred and ninety-two (at two dollars each)	2,584 00	
Received for fines imposed by the Recorder for violations of the sanitary and plumbing codes	140 00	
Received of John J. Doll, "scavenger's license"	30 00	
Henry T. L. Hillman for scavengers' permits	92 70	
Henry T. L. Hillman, license, 3 scavenger wagons,	45 00	
Total receipts for the year from all sources		$6,579 17
1891.		
March 21st. Balance of cash on hand in the First National Bank of Paterson, to the credit of this Board		$73 25
1890 and 1891.		
Paid John L. Leal, Health Inspector	$1,200 00	
John Hickman, Plumbing Inspector	1,325 00	
James W. Smith, Assistant Health Inspector	600 00	
Wm. Barnickel, Market Inspector	298 00	
Wm. Barnickel, Sanitary Policeman	200 00	
James Fitzpatrick, Sanitary Policeman	575 00	
Wm. I. Lewis, Counselor	499 94	
John J. Warren, Secretary and Treasurer	707 96	
Total salary account except that of the Treasurer, Philander A. Harris, which remains unpaid		$5,405 90
Paid various physicians for reporting contagious diseases		116 25
The N. Y. and N. J. Telephone Co., for telephone service		50 00
For the care and maintenance of the contagious disease hospital	$145 67	
For infected clothing destroyed	36 00	
For vaccine matter	20 00	
Total		205 67
For disinfectants		42 91
For horse hire for the Plumbing Inspector	$10 15	
In the purchase of a horse, wagon and harness for the use of the Plumbing Inspector	200 00	
For board of horse of the Plumbing Inspector	153 37	
For horseshoeing of the Plumbing Inspector's horse	9 77	
For repairs to wagon of Plumbing Inspector	9 85	
For printing and incidentals on account of plumbing inspection	13 45	
Total		396 59
For printing, advertising, stationery, stamps, horse-car tickets and incidentals		288 60
Total disbursements for the year		$6,505 92
Balance of cash on hand in the First National Bank of Paterson, to the credit of this Board		73 25
		$6,579 17

The above is intended simply as a synopsis of the work accomplished by this Board during the last year. Brief as it is, however, we congratulate ourselves that it shows good and earnest work on our part, and also shows that we are fully alive to the responsibilities resting upon us as guardians of the lives and health of the people of a city of nearly 80,000 inhabitants.

To the citizens in general we wish to express our indebtedness for the almost universal support which they have given us in the performance of our duties. As a rule, our requirements have met with a prompt and ready obedience, and seemingly, also, a full understanding of their necessity and importance. With the same or better support in the future we feel that we can safely promise to make our city the equal, from a sanitary point of view, of any of its class in the country, as it is to-day at least the equal of any city in our State.

JOHN L. LEAL, M.D.,
Health Inspector and Secretary.

PASSAIC CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. F. H. Rice, President; John H. Bowker, Secretary; R. A. Terhune, Frank Popple. William H. Carroll, Inspector. Post-office address of all, Passaic.

Water-supply very good; furnished by Aquackanonk Water Company and Passaic Water Company, the former from Vreeland's lake, and the latter from Passaic river, above Passaic bridge, at Paterson. Sewers have been built in almost all the streets and all buildings have been or are being connected with them, cesspools being done away with. It is the Waring system. A public park has been purchased during the year. We have six public schools, but they are crowded, especially in the Fourth ward, the Board of Education having to hire halls for its use till the addition can be completed. The city, during the year, has bought a farm of ten acres, including a building which stood on it, for a poor-farm. Garbage and excreta, taken out of the city, are used by the farmers. Market inspection has been provided by the Board. Placarding houses in which contagious diseases exist has been adopted. Public health laws and regulations are regulated by city ordinances. Quarantine over contagious diseases is promptly attended to.

JOHN H. BOWKER,
Secretary.

POMPTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. J. C. Morgan, Pompton; Lemuel Van Nees, Assessor, Pompton; Daniel A. White, Erskine; John J. Sisco, Butler; Silas Mead, Bloomingdale.

There have been no cases to require any action of the Health Board, and ordinances have been passed.

LEMUEL VAN NEES,
Assessor.

WAYNE TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George R. Berdan, Chairman, Mountain View; G. G. Jeffries, Mountain View; David F. Duncan, Paterson; John G Merselis, Paterson.

Good and abundant water is obtained from wells and springs. Refuse is mixed with the soil and used as a fertilizer. There are but two very small slaughter-houses in the township and they are properly taken care of. There are five school buildings, four of wood and one of concrete. All are in good condition. There is one burying-ground in the township, which is well cared for. It has not been necessary for our Board to do anything except to organize.

WEST MILFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Henion, Echo Lake; David Vanderhoof, Oak Ridge; Sylvanus Gregory, West Milford. Joseph H. Schulster, Assessor, Echo Lake.

SALEM COUNTY.

ALLOWAY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Richard Banks, Alloway; Daniel D. Hitchner, Cohansey; William Sickler, Yorktown; J. F. Ayers, Alloway; W. L. Ewen, M.D., Alloway.

Scarlet fever is existing at present, but not many cases. The members do not take much interest in these matters.

J. F. AYERS,
Assessor.

ELK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Benj. Ferrill, Glassboro; Wm. Hamilton, Unionville; George Ulmer, Unionville; Kiersey Morgan, Assessor.

ELSINBORO TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. Smith Reeves; Joseph B. Crispin, Samuel P. Smith, James W. Smith. Post-office address of all, Salem.

LOWER ALLOWAY CREEK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James Hood, Canton; Joseph Beaston, Harmersville; Wadington B. Ridgway, Hancock's Bridge; Dr. F. B. Harris, Canton; Mark T. Hilliard, Assessor, Hancock's Bridge; Dr. W. Scott Smith.

LOWER PENNS NECK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Lindsey, Salem; Charles Powers, Pennsville; Richard D. Batten, Pennsville. Ephraim Fowler, Assessor, Pennsville.

MANNINGTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David S. Fogg, Barclay Griscom, E. Smith Bassett, William H. Acton. Post-office address of all, Salem.

Township is supplied with water by wells and cisterns. Cellars mostly dry and used for storage. Very few houses are occupied by more than one family. No yearly house-to-house inspection. Cesspools mostly built with open bottoms; contents used for fertilizer. No sickness more than usual.

OLDMANS TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William F. Hunt, Assessor, Pedricktown; Frank Galventa, Pedricktown; Samuel Stanley, Pedricktown; Jacob J. Hunt, Auburn; Harry T. Johnson, M.D., Pedricktown.

PILESGROVE TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John G. Borton, Woodstown; George B. Grier, Woodstown; Charles Richman, Sharptown. C. H. Richman, Assessor, Woodstown. P. G. Sowder, M.D., Woodstown.

Have had no prevalent diseases among animals during the past year. Slaughter-houses in the township are kept in good condition and there have been no complaints in reference to them. We have had some complaints against several canning factories, owing to the custom of dumping refuse on exposed places, causing offensive odors. We have had a number of cases of scarlet fever. Have had no business of importance before the Board. General health of the township good.

C. H. RICHMAN,
Assessor.

PITTSGROVE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. M. Hitchner, Elmer; W. W. Golden, Centreton; J. M. Clark, Norma; J. W. Golden, Centreton.

There is nothing to report. The general health of the township has been good. The Board of Health has not been called together for any purpose.

J. W. GOLDEN,
Assessor.

QUINTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Anderson, Chairman, Quinton; Dr. William T. Good, Quinton; C. L. Smith, Quinton; John G. Towsend, Quinton; Gilbert A. Ayers, Shiloh.

There are at the present time several cases of typhoid fever in the township, but the trouble has probably been caused by the hot and dry weather. It seems to be due I think in part to the drinking-water, for all the wells are surface-wells and there has always been sickness when they run low.

JOHN F. ANDERSON,
Assessor.

SALEM CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Zaccheus B. Sickles, Clinton Bowen, Edwin Chew, Thomas Hewes, Josiah Wistar, C. M. Sherron, M.D., Harry Morrison. William Carney, Inspector. Post-office address of all, Salem.

We regret to say that the quality of the water furnished by the city pipes is not improved and is not considered fit for drinking purposes, except in winter. During the last year about 3,900 feet of sewer has been laid, consisting of eight and ten-inch terra-cotta pipe and provided with inspection openings and an automatic flush-tank at the head of the line. Numerous house-connections have already been made with it, and it is regarded as another step in the direction of improved drainage. Some difficulty has been experienced during the year in having the excreta satisfactorily removed and cared for. We think that the proper plan is to have one or more persons licensed by the Board for this purpose. During the past few months the disease known as hog cholera has again made its appearance and many hogs have died from its effect, though no cause can be assigned for its existence. To have hog-pens kept in the proper condition during the hot months is one of the difficulties our Health Inspector has to contend with, and so long as hogs are allowed to be kept within the city limits this difficulty will continue. A large and well-organized building for the use of the public school has recently been completed, in which one of Smead & Willis' patent ventilating arrangements was placed. This is the second public school building in our city provided with this system. A sanitary code was adopted in 1882, to which additions have since been occasionally made. The general health of the city has been good, though at this time several mild cases of scarlet fever and a few of diphtheria are said to exist.

JOSIAH WISTAR,
Secretary.

UPPER PENNS NECK TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John M. Bevis, Joseph Sailor, Edward E. Smith, Dr. David Moore ; Amos Norris, Secretary. Post-office address of all, Pennsgrove.

Water-supply by wells; some of it hard and not very good, sometimes discolored and a scum rises on it. As to drainage, it is very poor; some little improvement made every year. Prevalent diseases during the year have been malaria and remittent fever. There have been several complaints made to the Health Board of hog-pens, water-closets and stagnant pools. The Board was compelled to serve written notices on several parties to clean up their places, which some did, while others paid little attention to it. It seems as though the people have to be educated to respect the health laws, while some have to be driven to it. The Health Board is trying to get the people to keep things in proper condition withont forcing them to it.

AMOS MORRIS,
Secretary.

UPPER PITTSGROVE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Micajah B. Casseday, Elmer; Henry Coombs, Elmer; Hiram W. Smith, Whig Lane; M. J. Paulding, M.D., Daretown; Joseph N. Gray, Secretary, Pittsgrove.

The township has been remarkably free from any prevalent disease this year, and there have been no losses among animals. The Board of Health of the township organized in April, but no matter has been brought to their attention since organization.

JOSEPH N. GRAY,
Assessor.

SOMERSET COUNTY.

BEDMINSTER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Randolph Davenport, Pluckamin; Erastus Randall, Pluckamin; Lewis Van Dorn, Peapack; E. F. Fawn, Gladstone; William P. Sutphin, Bedminister.

The health of the township has been generally good during the year. Scarlet fever prevailed in Peapack, Pluckamin and Bedminster. The advice of the Board and the physician was willingly and promptly concurred in, the quarantine observed and the spread of the disease was checked. The Board have found in all cases, when called upon, a ready compliance to their demands upon the part of those of whom complaints were made.

BERNARDS TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Malcom Thompson, Bernardsville; James E. Ballentine, Bernardsville; Freeman Stelle, Millington; John Layton, Liberty; Dr. A. F. Voorhees, Basking Ridge. Robert Hanna, Bernardsville, Inspector.

The Board has been called in session twice this year, once on account of carcasses being left unburied and once on account of some outbuildings needing attention. The nuisances were promptly abated. No epidemics prevailed during the year. We consider our township in good sanitary condition. A. F. VOORHEES, M.D.

BRANCHBURG TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theo. Starner, North Branch; Ellsworth Brokaw, South Branch; Adonis Nelson, Neshanic; John N. Van Liew, Neshanic; William H. Dolliver, Neshanic.

No prevalent diseases during the year. This is a rural district and a healthy portion of the State, owing to high elevation and fresh running water. No complaints have been made to the Board.

E. BROKAW,
Secretary.

BRIDGEWATER TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. H. Brokaw, Somerville; Wm. K. Hope, Raritan; A. L. Stillwell, M.D., Somerville; John H. Pattison, Bound Brook; C. L. Voorhees, Bound Brook.

Sewers have been built in Somerville, which are very satisfactory. A new male building is being constructed at the poor-farm. Bound Brook is now a separate borough. The health of the township is excellent.

C. L. VOORHEES,
Secretary.

FRANKLIN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. R. Hodge, Chairman, South Bound Brook; L. J. Suydam, Franklin Park; John L. Totten, Middlebush; J. W. Voorhees, East Millstone.

The Township Committee regularly organize as a Board of Health. Complaint being made to the Board as to a nuisance at East Millstone, the parties in charge were duly notified and the nuisance abated at once. September 22d a complaint was made to the Board of several places in South Bound Brook where a nuisance was being caused by badly-kept hog and cattle-pens. The Board ordered all parties to clean up and abate the nuisances, which was promptly done.

T. R. HODGE,
Chairman.

HILLSBOROUGH TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. William Merrell, South Branch; Peter J. Quick, South Branch; Joseph H. Van Clief, Hillsborough; John W. Oakey, Blackwell's Mills. George H. Miller, Inspector, Somerville.

Cellars mostly dry. No prevalent diseases this year. Almshouse inspected once a year; in good condition. We have made a thorough examination of the Slater House ponds and cesspools, and every place that would be likely to produce disease, and have found everything in good condition.

JOHN W. OAKEY,
Assessor.

MONTGOMERY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Isaac Williamson, Rocky Hill; Jacob S. Hoagland, Harlingen; Stephen S. Voorhees, Blawenburg; Abram B. Mosher, Griggstown. William Oppie, Assessor, Harlingen.

During the summer I personally visited every house in the township, and I must say with few exceptions they are kept clean. We have three slaughter-houses in the township, which are neatly kept. The general health of the township has been good, no contagious diseases having prevailed.

NORTH PLAINFIELD BOROUGH AND TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Rev. T. Logan Murphy, William E Honeyman, P. M French, B. S. Brader; J. H. Carman, M D., Secretary. Post office address of all, Plainfield.

Aside from an epidemic of measles which prevailed very generally in the spring, whole families, in some instances, being stricken at the same time, North Plainfield has enjoyed a healthy year. A threatened outbreak of diphtheria was averted in April by a strict quarantine and thorough fumigation of the premises where the disease occurred. In this instance the contagion was brought from New York, by a mother who had been nursing two of her grandchidren, both of whom died, and conveyed to her daughter, who also succumbed to the poison. As foretold in my last year's report, the borough is well lighted by electricity, and a system of water-supply which will give us pure water and adequate fire protection is being pushed rapidly to completion. In fact, we may now be said to have a water-supply, as the water is turned on in most of our streets, and not a few houses have made connection therewith.

J. H. Carman, M.D.,
Secretary.

WARREN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

SUSSEX COUNTY.

ANDOVER TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Levi N. Space, Chairman, Newton; Charles Gardner, Secretary, Andover; George O. Young, Treasurer, Andover; J. C. Clark, M.D., Andover. Green C. Cook, Assessor, Andover.

Principal water-supply for domestic uses obtained from wells and springs. No contagious diseases, no losses of animals, during the last year. General health throughout our township is good. No slaughter-house nuisances. No ordinances passed.

G. C. Cook,
Assessor.

BYRAM TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John D. Lawrence, Chairman, Stanhope; Robert Slaght, Stanhope; David Stone, Andover. D. W. Goble, Assessor, Andover. C. H. Davisson, Inspector, Stanhope.

The water-supply is mostly from springs and wells. All impregnated more or less with iron. Two new school-houses have been built, and one repaired, and there will be now but one old school-house left in the township. Public health laws well observed. We have appointed a medical member to look after the sanitary condition of our township.

FRANKFORD TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Oscar Northrup, Jacob A. Coursen, J. C. Price, M.D., Geo. Phillips, Assessor; E. S. Dalrymple, M.D. Post-office address of all, Branchville.

The Board found the two slaughter-houses situated within the village of Branchville in a condition detrimental to the citizens. These were ordered removed beyond the limits of the town, and their former sites thoroughly disinfected.

GREEN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David B. Stackhouse, Chairman; G. L. Laing, Tranquility; William C. Gray, Huntsburg.

HAMPTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John S Coursen, Newton; Abram S. Morris, Newton; Andrew J. Williams, Baleville; Moses Ackerson, Halsey.

There are but few cesspools, and those that do exist are built with open bottoms and have never been emptied. There have been no prevalent diseases. Our township is thinly populated and is very healthy. There has been nothing for our board to do during the year.

HARDYSTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John A. Paulison, Stockholm; Obadiah Bunn, Hamburg; Daniel D. Munson, Franklin Furnace. Horace E. Rude, Assessor, Hamburg.

General good health has prevailed throughout the township during the year. No complaints have been made, and nothing has come to the attention of our Board. But the increase of our population and manufacturing interests will soon make it necessary to have a more careful oversight of the public health.

HORACE E. RUDE,
Assessor.

LAFAYETTE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel Warbasse, Lafayette; John M. Hull, Lafayette; William R. Coal, Beaver Run; Nelson Ackerson, Lafayette.

MONTAGUE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joshua Cole, Montague; Joseph S. Hornbeck, Montague; Santford Nearpass, Tri-States, New York. William P. Hornbeck, Assessor, Montague.

There have been no special meetings of the Board the past year, it having been a year of universal good health. There have been no complaints.

WILLIAM P. HORNBECK,
Assessor.

NEWTON TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. B. Brickner, Chas. S. Steele, Patrick Devaney. George Hardin, Assessor. Post-office address of all, Newton.

SANDYSTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

SPARTA TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edgar Munson, Assessor, Sparta; T. H. Andress, M.D., Sparta; J. T. Dolan, Ogdenburg; J. H. Sutton, Monroe; C. H. Beatty, Sparta.

STILLWATER TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jesse Sherrad, Swartswood; David R. Swayze, Fredon; Obadiah Van Horn, Stillwater; John L. Updike, Stillwater; C. V. Moore, M.D., Stillwater.

No diseases of animals have occurred during the past year. As physician of the Board, I would report the continued good health and exemption from any prevalent disease among our inhabitants during the past year. C. V. MOORE, M.D.

VERNON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Carlos Allen, Vernon; A S. Blanchard, Vernon; A. P. Shaw, Vernon; S C. Wright, McAfee Valley.

WALPACK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Elijah Gariss, Flatbrookville; Nathaniel Van Auken, Flatbrookville; Emmet H. Bell, Walpack.

WANTAGE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jonathan Coykendall, Jacob Swartwout, F. V. K. McCoy; Dr. Vangarsbeck, Physician; Newman Hall. Post-office address of all, Deckertown.

The health of the people in the township has been remarkably good for the past year. There have been no epidemics, and no contagious diseases, either among horses or cattle. The population being rural, there seems to be nothing to do except to abate a few nuisances. Our Board organized but has not passed ordinances.

N. HALL,
Assessor.

UNION COUNTY.

CLARK TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John A. Haliday, Marx Reufel, Andrew Gobson, Dr. W. E. Cladek; F. P. Bullman, Secretary. Post office address of all, Rahway.

CRANFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

ELIZABETH CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. Whelan, President; James J. Manning, Secretary; Dr. William A. M. Mack; Dr. James S Green, Jr., Physician; William Birnie, Jr., John J. Donahue. E. G. Putman, Inspector. Post-office address of all, Elizabeth.

Inside water-closets removed and placed outside in the public high-school. The crematory process has been substituted in public schools Nos. 3 and 4, in place of inside closets. There will soon be sewers constructed in Pine and Bond streets. I have caused the foul gutters in said streets to be flushed by water from hydrants when practicable, and this has afforded temporary relief at a very small outlay. The condition of the Elizabeth river has been very much improved. At and above West Jersey street, streets and gutters have been kept in better condition than usual. Very many residents are now using city water in preference to water from wells. I have analyzed water from many suspected wells, and in some cases have ordered the wells closed; in others a thorough cleaning has removed the source of foulness. Number of cases of contagious and infectious diseases reported for the year: Diphtheria, 57; scarlet fever, 53; measles, 29; typhoid fever, 8; typhus fever, 1; whooping-cough, 2; chicken-pox, 1.

E. G. PUTMAN,
Inspector.

FANWOOD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hon. George Hyte, Fanwood; L. W. Miller, Scotch Plains; William Terry, Plainfield; John Robison, Scotch Plains; F. W. Westcott, Scotch Plains.

Water-supply from wells and cisterns. At Fanwood about twenty-five houses are furnished with water from the Fanwood Water-Supply Company. This supply is obtained from driven wells and proves to be an excellent quality of water in every way. The usual water-level is such as to secure dry cellars. Most of the swamps are properly cared for, and we have very little malaria. We have no system of sewerage. In a part of the township cesspools are not cemented, but laid up with loose stone. In Fanwood they are cemented and most every house has two or three connected with each other. They are emptied as often as it is necessary. We have had no prevalent disease this year, except la grippe, and that in a mild form. We have no slaughter-houses in our town. We have no ordinances. The Board meets each month. We have had no trouble this year, as each case reported to the Board has been attended to in a satisfactory way. I am glad to say that the people are each year growing to look on the work of the Local Board in a very friendly way, and seem anxious to obey the laws and rules as laid down. We have so far only to request and every nuisance is promptly abated.

F. W. WESTCOTT,
Secretary.

LINDEN BOROUGH.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Grileger, Rev. Oscar Gesner, Hon. Ferdinand Blancke, Ernest A. Knopf, Mr. Rue, John A. Ethridge. Milton C. London, Inspector. Post-office address of all, Linden.

I have the pleasure of reporting that the past year has been one of unusual good health. No cases of contagious disease.

JOHN A. ETHRIDGE,
Assessor.

LINDEN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. Metz, Chairman, Tremley; John P. Winans, Tremley; Jacob M. Winans, Linden; William F. Donaldson, Linden; George A. Benwell, Linden; John F. Spinning, Elizabeth; Moses W. Mulford, Elizabeth; Dr. Henry C. Pierson, Inspector, Roselle; Philip Shangle, Roselle.

The past year throughout the township has been one of unusual good health. Three or four cases of scarlet fever have occurred of a very mild form, and through the timely and prompt action of the parents and the use of disinfectants, the disease was kept from spreading.

JOHN A. ETHRIDGE,
Assessor.

NEW PROVIDENCE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John M Badgley, New Providence; Samuel R. Valentine, New Providence; Lewis Bergmiller, Berkeley Heights. A. M. Cory, M.D., Inspector, New Providence.

The health of the community has been excellent during the year, excepting the prevalence of la grippe, to some extent, during the winter and spring. Health ordinances have not been passed.

A. M. CORY, M.D.,
Inspector.

PLAINFIELD CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Rockfellow, President; Lemuel W. Serrell, Stephen A. Ginna, George W. Endicott, M.D. Oliver B. Leonard, Secretary. Post-office address of all, Plainfield.

The water is obtained from twenty driven wells, reaching to the underground sources of supply, and the supply is about 2,500,000 gallons per day if required. At present but a limited number of house-takers have availed themselves of its advantages. The character of the water is excellent. The year just closed has witnessed a quiet but continuous work by the Board in looking after the healthfulness of Plainfield. The Health Inspector has reported 495 personal inspections of different properties, and 100 mandatory notices, for the removal of nuisances, have been served. During this time 460 cesspools have been emptied and 346 vaults cleaned. The collection of kitchen garbage is attended to by regularly-licensed persons, often enough every week to prevent any accumulation. In these ways and many others the Board has endeavored to promote a fair degree of healthfulness by averting the causes of preventable diseases. It is a pleasure to be able to report another year of good health, notwithstanding the great amount of upturning of fresh earth for laying water-mains, &c., and the excessive moisture of oversprinkling. The number of cases of sickness has been smaller this year than any recent year.

OLIVER B. LEONARD,
Secretary.

RAHWAY CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Elihu B. Silvers, M.D., President; John M. Tufts, M. H. Acken, W. E. Cladek, M.D. Charles H. Lambert, Inspector. Post office address of all, Rahway.

The health of the city has been exceptionally good. There have been more complaints in regard to small nuisances this year than usual, but they have been abated without difficulty.

CHARLES H. LAMBERT,
Inspector.

SPRINGFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. Cox, Abner P. Stikes, Albert P. Carter, J. J. Huff. T. G. Cusack, M.D., Inspector. Post-office address of all, Springfield.

Our Health Board has been active and prompt in performing its duties, although not having any case of a bad nature to contend with. Several small nuisances have been abated without any trouble. We have had very little sickness during the past summer. Some of the ponds in the township have been drained. We have held monthly meetings during the summer. No contagious diseases have been reported.

F. G. CUSACK, M.D.,
Inspector.

SUMMIT TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Parker W. Page, James H. Kelly, John A. Hicks; William H. Risk, Physician; John W. Hughes, Assessor; J. J. Lane, Secretary. Post-office address of all, Summit.

The water-supply is controlled by a private company. About two hundred and fifty connections have been made with the mains. When necessary the water comes from driven wells. The new sewer system is being introduced. The Board has rigidly enforced the ordinances and has had very few complaints. There have been no prevalent diseases.

UNION TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James B. Woodruff, Roselle; John Leonard, Union; William A. Allen, Hilton; D. Hobart Sayre, Union.

But very few complaints have been made, and these were acted upon either by committee or the Board, or, when the case seemed to warrant it, by the whole Board. Where nuisances existed, parties were notified to abate the same. Our requests were always kindly received and acted upon, and we have never been compelled to enforce any penalties.

D. HOBART SAYRE,
Secretary.

WESTFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. C. Endicott, N. B. Gardner, A. S. Clark, Jos. B. Harrison, M.D., John M. C. Marsh, Secretary.

Our Board holds regular meetings and is in good working order. Have had no contagious diseases to contend with the past year.

J. M. C. MARSH,
Secretary.

WARREN COUNTY.

ALLAMUCHY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alfred Buckley, S. H. Drake, Mathias Hibler. E. J. Hardin, Assessor. Address of all, Allamuchy.

We have had no prevalent diseases this year. Our Board of Health has never organized.

E. J. HARDIN,
Assessor.

BELVIDERE TOWN.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George A. Augh, P. S. Yetter, Simon Wade, Leo Rehner, Geo. Lommarson, J. Treator, Frank Joiner. Post-office address of all, Belvidere.

BLAIRSTOWN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John I. Blair, Blairstown; Jacob A. Smith, Blairstown; Samuel Linaberry, Walnut Valley.

Our Board of Health has never regularly organized, but the health of the township is good and we have a good public water-supply. JOHN C. JOHNSON, M.D.

FRANKLIN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Pursel, New Village; Albert C. Metler, Broadway; Marshall Hoffman, Asbury; William Vliet, Assessor, Franklin.

FRELINGHUYSEN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Stickler, Johnsonburg; John V. Allen, Marksboro; Reed Kerr, Johnsonburg; W. H. Ackerson; Johnsonburg; Frederick Rorback, M.D., Johnsonburg.

Our water-supply is taken from wells and springs. The water-level is such that we have very dry cellars. The past year has been a very healthy one, and there have been no prevalent diseases.

W. H. ACKERSON,
Assessor.

GREENWICH TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. P. Kinney, President, Stewartsville; Philip Hance, Bloomsbury; Robert I. Smith, Treasurer, Bloomsbury; Enos E. B. Beatty, M.D., Stewartsville; William Sherer, Secretary, Bloomsbury.

The Board has passed a code of ordinances within the last year. No prevalent diseases reported. There was complaint made to the

Board of a foul odor arising from a hog-pen and cow-stable situated in the village of Stewartsville. The Board was called to view the premises but found everything cleaned up. Served notice on parties to the effect that hereafter the said premises must be kept in a healthy condition or that they would suffer the penalty for any neglect.

WILLIAM SHERER,
Secretary.

HACKETTSTOWN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. H. Dellickie, G. W. Smith, James Tomblyn, Wallace Taylor, Dr. J. S. Cook, Dr. A. E. Martin, A. W. Cutler. J. M. Everett, Inspector. Post-office address of all, Hackettstown.

There have been no prevalent diseases during the year. Our water-supply is first-class; could not be better. There has not been much for our Health Board to do this year.

THOMAS NOLAN,
Clerk.

HARDWICK TOWNSHIP.

NAME AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No report received.

HARMONY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James W. Dewitt; Henry Metz, Harmony; Ralph Rush, Montana; J. D. De Witt, M.D., Harmony.

No prevalent diseases during the year. Public health good. School-houses are new and comfortable. Vaccination is neglected. Nothing special to report.

J. D. DE WITT.

HOPE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George G. Depue, Henry Aten, John Parke, John Miller, M.D. R. M. Van Horn, Assessor. Post-office address of all, Hope.

INDEPENDENCE TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James F. Johnson, Hackettstown; Andrew Ayers, Hackettstown; A. D. Simanton, Vienna.

KNOWLTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William B. Moore, Columbia; John Albertson, Delaware; G. M. McCracken, Polkville; Ephraim Dietrich, Columbia; Robert Bond, M.D., Knowlton.

Swamps are common, but there is no malaria to speak of. Most of the people depend upon wells. Water is frequently hard. There have been no prevalent diseases this year. The Board has passed ordinances. There are no slaughter-houses in the township. Vaccination sadly neglected in the township. It has been an exceptionally healthy year; no epidemic has occurred here.

ROBERT BOND, M.D.,
Inspector.

LOPATCONG TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Amey, President; G. G. Dewitt, Ed. H. Paulus, Robert Barker, M.D., Physician; Rowland Firth, Secretary. Post-office address of all, Phillipsburg.

Wells and cisterns depended upon for water. Conformation of the land is hilly. Population, 2,000. Climate mild. One small slaughter-house located in the township; no complaint therefrom.

Ordinary schools and buildings cared for. There has been no necessity for special organization. We have simply organized in compliance with the law.

ROWLAND FIRTH,
Secretary.

MANSFIELD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Nicholas Martenis, Port Murray; William H. Thompson, Beattystown; Edward S. Morlatt, Karrsville. James Beatty, Assessor, Stephensburg.

OXFORD TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Hildebrant, Belvidere; William Miller, Jr., Oxford Furnace; George A. Wildrick, Oxford Furnace; Charles Wiseburn, Assessor, Oxford Furnace; L. B. Hoagland, M.D., Oxford Furnace.

We have no sewers. Cesspools not cemented; instead of emptying them when necessary, they are generally filled up and a new one dug. There have been no prevalent diseases. There has been but little for the Board to do during the past year, except to look after and correct some minor nuisances.

L. B. HOAGLAND, M.D.,
Secretary.

PAHAQUARRY TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Zimmerman, Calno; Moses M. Depue, Calno; Adam Gransue, Dunfield. Jason K. Hill, Assessor, Millbrook.

PHILLIPSBURG CITY.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Otto Rehfuss, Inspector; Dr. A. P. Jacoby; C. D. McClary, President; Isaac Miller, John Warner, William H. Carey. Post-office address of all, Phillipsburg.

The water is supplied by a private company; the supply is taken from the Delaware river. About 800 houses take it. The supply is very satisfactory. Seventy-five per cent. of the population use cisterns. We have a partial system of sewerage, constructed in 1889. Length of sewers, 3,500 feet; grade, one to the hundred. There are only a few houses that have made connections with this system, about fifteen in all. We have had a few cases of scarlet fever and of diphtheria. There is a register kept of persons keeping animals within the city limits. No ordinances passed. The Board has done nothing the past year, except to look after the streets and gutters, &c. There has been some neglect on the part of physicians in reporting contagious diseases.

F. NIEDLER,
Clerk.

POHATCONG TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Marshall Hawk, Assessor, Shimers; George Snyder, Reigelsville; Charles Shirer, Shimers; William Case, Shimers.

WASHINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Wycoff, Port Colden; John P. Castney, Changewater; Peter Wellen, New Hampton; William Miller, New Hampton; Thomas Martin, Washington.

Fortunately for us all, there has been very little sickness during the past year with no contagious diseases, except measles in a light form.

WILLIAM MILLER,
Secretary.

CIRCULARS AND LAWS.

CIRCULARS.

The Board has forty circulars on its permanent list. These either give the general or special health laws of the State, or present in brief form the most important facts of sanitary information. They are widely distributed through the State and are often called for by Local Boards or individuals, when some epidemic is prevailing. They present almost every subject of special importance to the health interests of the people.

During the year the whole series has been carefully reviewed, in order that these guides may be kept abreast with the advance of sanitary knowledge and administration. In co-operation with the State Superintendent of Schools, Circular 54 has been sent to each school district of the State and most valuable facts are secured. Experience has shown that the necessity of stating in detail actual conditions, leads to the correction of many evils. Circular 75, Health Inspectors' Guide, is found of much service. Two new circulars, 76 and 77, have been issued, the first on Communicable Diseases in Schools, and the second on Diphtheria. They have been distributed with thoroughness through the State. The bound "Book of Circulars" is in the hands of most Boards of Health and some others, who thereby become more fully informed as to health needs.

A new edition of the circular on institutional inquiry is also ready, and will add much in systematizing this division of our work. We herewith publish the two circulars named and commend them to the special attention of teachers and physicians.

CIRCULAR LXXVI.

OF THE

NEW JERSEY STATE BOARD OF HEALTH.

(School Circular No. 4.)

PROTECTION OF SCHOOLS FROM COMMUNICABLE DISEASES—METHODS TO BE OBSERVED WHEN THEY OCCUR.

One of the most disturbing factors that can occur in reference to the health and education of children is the outbreak of a contagious disease in a school. If it is in a public school or one in which the children board at home, the effect often is to spread over a whole city or community a disease which was confined to a single family or one little portion of a village or town. If it is a school made up of boarders and day scholars, many perplexing questions arise as to the separation of the two or the disposition to be made of the scholars individually or as a class. If it is a boarding-school there are the disadvantages and anxieties connected with the sickness of children away from their parents or the breaking up of the school for a time, thus not only disarranging the course of study, but often carrying contagious disease in public conveyances to cities, villages and hamlets where it is not prevalent. This Board has often been called into private consultation in these emergencies both in public and private schools, and too often where the disease has been illy managed so far as methods for the prevention of its spread were concerned. The design of this brief article is to indicate our present views on this subject.

Hygiene is first of all a preventive art, and so the first point is *how to prevent* the occurrence of contagious disease in schools as well as in case of occurrence to confer upon it as mild a type as possible. To this end there must be, *first* of all, the most thorough attention to buildings and surroundings and to all those details as to cleanliness, heating, ventilation and care which are included in thorough sanitary arrangements and good housekeeping. Strange as it may seem, no class of buildings suffer so much for the lack of thorough *housekeeping* as colleges, select schools, public schools and boarding-schools.

It is not necessary here to enumerate all the details included under this heading.

Second. There must be close attention to the individual. In assemblages from so many homes of different grade and locality and of persons of various habits, there is need of special knowledge as to the cleanliness of each scholar and sometimes of the teachers. The hair and the hands need special watchfulness. Schools, in their first assemblage in September, are often disturbed by the occurrence of diseases after a couple of weeks, because pupils, just gathered in from what is too often the unsystematic life of vacation and from various unusual exposures, develop fevers or prevalent diseases.

A foul mouth, uncleansed teeth and a foul breath are often a cause of disease. We have great diffidence in interfering with any expression of affection, yet a kiss on the lips is not always a sanitary act. A plain talk on "Mouth Cleansing and a Sweet Breath" is seasonable in an opening term.

The same is true as to all spittle. It is probable that not only diphtheria but other forms of sore throat are communicated by dried particles therefrom. The same is true as to most of the eruptive diseases and as to whooping-cough. It is now claimed that consumption and even pneumonia may be communicated to susceptible persons in this way. School children should be forbidden to spit on the floor. Girls do live without it, and boys ought to. One or two spittoons with water in should be allowed in each school-room, to which those should be allowed to go who have to spit. They must be cleansed each day.

Uncleansed finger-nails often carry particles of contagious matter.

Third. Were I the conductor of any form of boarding-school I would, five days previous to the school opening, forward to each parent a request to send the following facts as to the pupil to be entered:

I. What children's diseases has the pupil had?

II. Has he within two weeks been exposed to any contagious disease, and if so, what?

III. Has he been vaccinated, and if so, when?

IV. Have you any information to give as to his general health or as to any particular tendencies to be guarded against?

V. If the pupil on any visit home is exposed to any contagious disease, be so kind as to acquaint us of the fact.

VI. In sending clothing or other articles to the pupil, be sure that these shall not come from any room or locality in which there has been exposure to contagion.

The Principal should arrange all ascertained facts in a table, so as to be able to make ready reference as to each scholar.

We believe all parents will appreciate such precautions and inquiries. Although the Principal must not be excessive in his particularity, it is due the school that he be in possession of such facts, and use them as needed.

The plan of physical examination and inquiry as to each pupil at the beginning of each term, and a record thereof as now made in some institutions, is an excellent one.

As to day scholars in public schools, it seems to us proper that a notice, in some form, be given to each parent, that scholars are not to be sent at the opening of the term from houses in which there is contagious disease, except with the consent of the physician, and that they are to be kept at home in any outbreak of disease unless the physician regards their attendance as safe. It is always to be remembered that disease is spread more by mild cases than by those confined to a room.

Where no physician is employed the parent should refer to the teacher the question as to when return to the school is permissible. With clean clothing, thorough bathing and proper habits of cleanliness, return is allowable from some homes much sooner than from others. At times when any special, communicable disease is very prevalent in any town, the teacher should be especially but quietly watchful as to the physical condition of the pupils, and excuse any from attendance who seem to be not as well as usual. In a boarding-school, as a rule, a pupil should be put in his room and to bed, if having a chill or severe headache and general aching, or sickness of stomach and fever, or sore throat, so that the teacher may see if it passes over in a few hours, or send for a physician. Day scholars, if complaining of illness, should be allowed to sit separately or in an ante-room, when they cannot be at once sent home. If not returning to school for two or three days, the cause should be known.

It is a delicate and difficult matter to have proper precaution and yet avoid the kind of inquiry and anxiety which too often disarranges a school or suspends it unadvisedly. This, like other judgment and tact, is acquired by experience, guided by knowledge. Constant vigilance is necessary, and must be exercised.

Fourth. The serious question now comes: What is to be done when a case of contagious disease occurs?

Action will be different in different cases and in different diseases. Here are some of the general rules by which we have been guided with success in several instances:

(*a*) If the case has been early separated, vacate adjacent rooms, and assign a care-taker who does not mingle with others In due time apprise the parents of the real facts, and give to them the judgment of the physician and yourself as to the best course, leaving them to do as they think best, although not forgetting that they must not do anything to expose others.

(*b*) All of our colleges and larger schools should have a hospital building, or at least somehow it should be possible to thoroughly isolate real or suspected cases of communicable disease. We have several times prevented the adjournment of a school by early and proper precautions of isolation, and had no extension of the disease. It is often at least safe to wait and see whether a first case has communicated disease to others. It is always wise to avoid panic, and, what is more common, that state of anxiety which unsettles a school.

(*c*) Much depends upon what the disease is.

If it is measles, avoid exposing others, but, as a rule, continue the school. So as to whooping-cough. If it is small-pox, require at once each pupil to be vaccinated. If this is done within two days from first symptoms, it would not occur to us to disband a school on account of a case of small-pox.

Scarlet fever depends very much upon the type and number exposed, so that a physician, aided perhaps by a competent Health Inspector, may determine what action is needed. The teacher should know which of the pupils have already had it. As to diphtheria, the decision is often more complicated.

We easily connect the contagion of several other diseases with the breath, the eruption or the shedding of scarf skin, but the cause of diphtheria is less defined, and it often seems obscure and to cling to localities. Where a case of *diphtheria is positively made out* as distinct from follicular tonsilitis, or some other less specific form of throat disease, careful isolation will often prevent spread. If, however, there is any indication of spread, in our judgment both public and private schools are more appropriately adjourned for two weeks on account of this than for any other of the ordinary communicable diseases.

One great design of the adjournment is the most thorough and radical house-cleaning and disinfection of premises.

Where a case of diphtheria or scarlet fever can be shown to have been brought to a school there is more probability that the case will not be followed by others.

(*d*) Diseases of the eyes, especially if there is the least possible secretion of pus, are often contagious. Hence, any pupil having inflamed eyelids or eyes should at once receive attention and have a physician's certificate that there is no risk to others therefrom. Many skin diseases are communicable.

Where there is a prompt notification of contagious diseases, and prompt attention on the part of teachers, physicians and Sanitary Inspectors to first cases of diseases in their first stages, we are more and more learning the probability of preventing the multiplication of cases by prompt and precise isolation, and so saving the necessity of disruptive methods.

We almost hesitate to state how often, under strict management, we have known small-pox, scarlet fever, measles and diphtheria not to spread, lest some, imitating exact methods by half methods, should not secure all the details of isolation, and then regret that the school had not been disbanded.

Each case of communicable disease in a school is to be considered by itself in all its details as related to facts of exposure, possibilities of isolation, and what is involved in continuance of school or dismissal.

If so considered by judicious Principals and wise physicians and experienced sanitarians, errors in action will be made much less frequently. Only there must be promptness.

We herewith give a table of details as to the time of communicability of several diseases, after that just furnished by Dr. Whittelegge, which differs little from the one by Dr. F. Vacher, as found in the 11th Report of this Board, and which we also add:

	Quarantine to be required after exposure to infection.	Earliest date of return to school after an attack.
Small-pox	18 days.	When all scabs have fallen off.
Chicken-pox	18 days.	When all scabs have fallen off.
Scarlet Fever	14 days.	Six weeks, and then only if no desquamation or sore throat.
Diphtheria	12 days.	Three weeks, if convalescence is complete, and no sore throat, albuminuria or discharges remain.
Measles	16 days.	Three weeks, if all desquamation and cough have ceased.
Whooping-cough	21 days.	Six weeks from the commencement of the whooping, if the characteristic spasmodic cough and whooping have ceased. Earlier, if all cough be gone.
Rötheln, or Rubella.	16 days.	Two to three weeks, according to the nature of the case.
Mumps	24 days.	Four weeks, if all swelling have subsided.

This table assumes that a person exposed may himself convey contagion from the first.

It is never certain how soon a person who has been exposed to scarlet fever or diphtheria will take the disease or be in a condition to give it to others.

As to the other diseases named, this is not likely before nine days have passed. (See, also, Dr. Vacher's table as appended to this circular.)

Any such table is somewhat arbitrary. The time for the return to school can in many cases be shortened by proper precautions. When any contagious disease has occurred in a room, or more generally in a school, there should be *thorough and skilled disinfection*, such as is directed in other circulars of this Board.

These are familiar to Inspectors or can be had on application by postal. The circulars of this Board as to communicable diseases should be on hand, ready for reference by all Principals of schools. See especially, Circulars XXXVII., XLIV., XLVII. and LXIV.

Not only the welfare of each school, but the interests of the public demand that our schools should not so frequently be the means of multiplying cases of disease.

EZRA M. HUNT, M.D., *Sec'y.*

Copies of this and other circulars can be had by addressing postal, State Board of Health, Trenton, N. J.

VACHER'S TABLE.

DISEASES.	Time from inception to beginning of eruption.	Time from first precursory symptom to beginning of eruption.	Time from beginning of eruption to cessation of febrile state.	Time from the beginning of eruption till patient ceases to be infective.
Small-pox	13 days (range, 7 to 21 days.)	2 days (range, a few hours to 7 days.)	14 days	56 days.
Modified Small-pox	13 days (range, 7 to 21 days.)	2 days (range, a few hours to 7 days.)	14 days	35 days.
Chicken-pox	13 days (range, 4 to 17 days.)	2 days (range, a few hours to 3 days.)	5 days (range, 3 to 7 days.)	17 days.
Measles	14 days (range, 7 to 21 days.)	4 days (range, 1 day to 9 days.)	6 days	27 days.
Rubella, German Measles	14 days (range, 10 to 20 days.)	1 day (range, *nil* to 3 days.)	7 days	14 days.
Scarlet Fever	4 days (range, a few hours to 14 days.)	1 day	7 days	49 days.
Diphtheria	5 days (range, 1 day to 14 days.)	2 days (range, a few hours to 4 days.)	14 days	28 days.
Idiopathic Erysipelas	5 days (range, 2 to 14 days.)	1 day	14 days	35 days.
Typhus Fever	19 days (range, a few hours to 28 days.)	7 days (range, 3 to 7 days.)	7 days (range, 7 to 14 days.)	21 days.
Typhoid Fever	21 days (range, 1 day to 28 days.)	7 days (range, 7 to 12 days.)	21 days (range, 14 to 28 days.)	28 days.
Mumps	18 days (range 8 to 25 days.)	4 days	7 days	21 days.

CIRCULAR LXXVII.

OF THE

NEW JERSEY STATE BOARD OF HEALTH.

DIPHTHERIA.

To Physicians and Local Boards of Health:

This Board has hitherto presented to the attention of physicians the fact that diphtheria surpasses all of the so-called zymotic diseases in our records of fatality. It now urges that very special attention be given to the facts that have quite recently accumulated as to it. This is done in the belief that a united effort on the part of physicians, Health Boards, Sanitary Inspectors and parents can do much to limit the disease.

This belief is founded on the following facts:

1. Our knowledge as to the chief exciting cause of diphtheria is more definite than as to the eruptive diseases, and so localizes it as to give many hopeful indications as to modes of prevention and treatment. While some questions as to pseudo or simulated cases of diphtheria are still puzzling, it does not seem premature to say that it is caused by the Löffler bacillus.

Says Dr. Woodhead: "The fact must be accepted that careful clinical observation and experimental investigation have been made by many thorough workers, and that these workers have assigned to a special bacillus the power of giving rise to at least one form of diphtheria.

"The evidence in favor of the specific, infective Klebs-Löffler bacillus is now almost overwhelming."

More interesting and important still is it that we can make some definite statements as to it, which have an important bearing on sanitation and treatment.

(*a*) This organism does not occur in the blood, in the lymph or in any of the organs of the body. Its only locality is in the false membranes composed of fibrinous lymph and altered epithelial cells that are found in the throat.

The poison which gives rise to the constitutional symptoms is formed only at this point and is there absorbed and carried to various parts of the body.

It is true that other organisms beside it are found in the throat, and that these undoubtedly give rise to symptoms that simulate true diphtheria. But the fatal form of diphtheria is probably never caused by these microbes.

(*b*) These organisms are of such rapid growth that from the time of entrance and locating, colonies visible to the naked eye may form in twenty-four hours, which is not the case with any other organism.

Yet they are more affected by local antiseptic applications than most organisms. As they soon choose the deeper layers of the exudation and leave the more superficial to other organisms, they are not reached as easily in older membrane as they are in that which is very recent.

While not able to say that a sound and normal throat structure is never attacked, the start is almost invariably upon a weakened mucous membrane, a sore throat not yet diptheritic or a wounded or abraded surface. It is here that the mischief begins and the bacilli rapidly secrete a poison which is absorbed and produces characteristic effects.

(*c*) The diphtheritic poison is always more active when alkaline. Acids, locally or when they reach the lower part of the membrane continuously, seem to restrain or destroy it.

"At first sight it would seem that in the case of the diphtheria bacillus, there is, on account of the extreme activity of the poison, little hope of rendering the tissues of an animal resistant to its action, as even very minute doses produee marked poisonous effects. On the other hand, however, we have from the nature of the position and development of the poison, indications as to treatment and also as to prevention of the disease."

Its real incubating stage is within sight, and watchfulness of it *in situ*, and proper local treatment promise increased success, if only it can be entered upon early.

The bacillus of diphtheria is often in the mouth without finding a soil ready for its reception. "It appears that these bacilli can exert little or no injurious effect where the mucous lining of the throat, larynx, nostrils, &c., remains sound and unaffected by minor diseases." Hence, all sore throats need watchfulness.

(*d*) While the diphtheria bacillus is wilted and destroyed by moist heat at 58° C., *antiseptics* have decided influence in inhibiting its activity.

If there is not a continuance of antiseptic washes after apparent local recovery it is often found in the mouth for days after local symptoms have subsided.

(e) At ordinary temperatures these bacilli retain their vitality in rooms and upon bed-linen for weeks, although light, sunlight and air, if continuous and repeated, have great power for their destruction.

(*f*) The bacillus of diphtheria grows and is promoted into virulence, both on the fauces and outside the body, by the presence of other organisms, and by those filth conditions which, if they do not cause benign or common organisms to be changed into malignant or specific ones, do so assure their presence as greatly to add to the gravity of the disease.

Such is the clear voice at present of microscopic and biological study, and of observant practice as to this disease.

It has its lessons both in treatment and in sanitary discipline, which, could they from year to year be applied with exactness in this State, would very largely diminish the number of cases and the fatality from this disease. Some of these lessons are as follows:

I. The disease should be dealt with locally, except where it is so far advanced that neither local application nor removal can hope to reach it. This means for the patient, careful and skillful survey of the entire throat and buccal cavity, and great perseverance in the use of local antiseptic methods.

But it also means *far more than attention to the individual patient.* In any case of well-ascertained diphtheria, each day before seeing the patient accounted as sick, the medical attendant should see the mouth and fauces of each one who has been at all exposed, the design being to prevent an incubatory stage.

Mild but frequent and efficient mouth-washes and gargles have an important place in a family in which there is a case of diphtheria.

II. Treatment should thus always be early, or if there has been delay, attention should promptly be given to any possibility of compensation for this by the active character of local treatment.

While local treatment of the disease will not relieve that part of it which has become constitutional and the treatment of which is so important, it will cut off the base of supply for the poison which is not generated inside. As many cannot use gargles thoroughly, and as such antiseptics as tinc. ferri chloridi, potassii chloratis, &c., are often indicated internally, it is safer that some of the wash be swallowed.

Many contend that, with those exposed, mouth-washes should be used before there are any positive signs of local disease, in order to keep the throat in an antiseptic condition.

III. The effect of acids on the bacillus, and of various antiseptic remedies, as well as of sustaining treatment, are more hopeful than when the poison is being actively produced inside of the body.

IV. The fact that bacilli may continue so long to be found in the mouth and in rooms and in clothing, makes it imperative that the most thorough methods of disinfection should be practiced as to the disease. What these are Circulars XLIV. and LXIV. state. Neither the bedclothes nor the patient's body-linen should be mixed with the other soiled clothes or admitted to the general wash until they are first disinfected.

Neither during nor after the sickness should garments, bed furniture or anything that has been in the sick-room be carried to or through other parts of the house. Let the room and its contents be disinfected apart from the rest of the house. Articles that cannot be put in solution can be thrown out or let out of windows, so as to have some light and airing. In this disease as in scarlet fever there is a special need for the exact details of isolation and disinfection.

Very hot water, chloride of lime, quick-lime, in the form of fresh whitewash, and sunlight in the room or on its contents out of doors are, as a rule in these cases, the most ready at hand and available disinfectants.

Where fumigation is necessary many prefer chlorine gas to the sulphur or sulphurous gas fumigation. It is thus described by Thudicum: "The best mode of disinfecting a room is by distributing chlorine gas in its atmosphere. The room being unoccupied, place a quarter of a pound of chloride of lime in a wide basin, stir it up with a quarter of a pint of water and pour into the mixture a pint of hydrochloric (muriatic) or dilute sulphuric acid. The person who has to mix these materials should be cautioned not to inhale the vapors which are rapidly evolved."

V. Other organisms so seem to favor the activity of this bacillus that we should watch for it as a sequel to other diseases.

As the vitality and virulence of various organisms are promoted by uncleanliness, we should pursue the most scrupulous exactness as to personal and local conditions and surroundings. Roux and Yersin are so impressed with the first point that they say: "It is necessary at the very commencement of simple forms of throat disease, and of those associated with measles and scarlatina, to practice careful and frequent swabbing of the throat with antiseptics."

As to local conditions, we can say from experience that sudden exposure of filthy matter about buildings, such as the spreading of cess-pool matter over gardens, or of foul compost over fields near a house, has seemed to cause distinct outbreaks of diphtheria. It has been recently claimed by good authorities that diphtheria is especially a disease of surface filth, perhaps because the throat and mouth are especially exposed to foul particles and the gases of decay. There is no disease in which the free and continuous use of air, sunlight and active disinfectants, about rooms or premises where it occurs, is more forcibly indicated. It is well to bear in mind that there are always more microbes in the air where there is much decomposing matter or where decaying particles are floating in the air; also where there is not uninterrupted circulation of air and occasional flushings by perceptible draughts.

Microbes, like other particles, cling to surfaces, and especially to damp walls, cellars and other moist surfaces, so that after a disease has ceased and the air of the rooms shows no micro-organisms, it is in part because they have settled upon surfaces. This emphasizes the importance of ventilation, sunlight, dryness and proper cleansing.

VI. There is no one of the zymotic diseases in which *isolation* is more important or results from it more hopeful. It is the mouth, and not the whole person, that, *in cases well isolated and well guarded from the first*, is the source of danger. But it is so great a source that it is to be recognized as a kind of cess-pit from which there must be protection not only by antiseptic washes but by separation. These microbes have here a factory in close relation to those around who may be susceptible. While it is not probable that the primary contagion is conveyed afar from the mouth, yet the breath and the mouth secretions are such a mode of conveyance, that careful isolation must be secured in each and every case, and must be enforced by the physician, and any aid rendered by the Health Inspector that the physician may desire.

Milk or other food must not be allowed to stand in the sick-room, and what is left must not be used by others. The nurse, when out of the sick-room, must not have others closely about her. All cats, dogs or other pet animals must be carefully excluded from the sick-room, and if possible, from the house. There is no doubt that they sometimes convey the contagion.

Attention must be given to children at school to see that they do not spread the contagion. No child should attend school from a house in which there is or has recently been diphtheria, without a permit from a physician.

VII. The spittle or mouth secretion must be diligently cared for from the start. It is best received into a small handbowl or deep saucer not over six inches in diameter, into which a piece of newspaper or other soft paper is fitted, so as to be easily removed with the spittle. This should be sprinkled over with a spoonful of chloride of lime, and changed three or four times a day, according to the amount of secretion. If there is a fire in the room it should be thrown into it; if not, it should be covered with boiling water for a half hour, and then thrown into a common receptacle. It is convenient for interchange to have two of these small bowls of about six inches inside diameter, and two or three inches in depth.

We have found these practically more useful than any other form of sick-room spitcups. Handkerchiefs and small pieces of rag should be used as little as possible, but are often necessary. A small separate piece to receive each spittle is best. This should be thrown into some small porcelain or iron, china or glass vessel containing chloride of lime in solution, and boiling water should be thrown over it before it is thrown into the closet. While it is the membrane which is the most hazardous, the entire secretion of the mouth must be cared for.

We have purposely not specified the kind of mouth-washes to be used or said anything as to general treatment, only because such treatises as those of Oertel, Löffler, Jacobi, Parker, Thorne and the various recent text-books of practice are sufficiently full.

It is our conviction that new light has come to us as to the prevention and management of diphtheria, and that success depends upon accurate attention to minute details, which the physician must direct and see carried out, and in the execution of which Boards of Health and Health Inspectors and parents must diligently aid him.

We believe it possible very greatly to diminish the frequency and mortality of this disease, and we earnestly urge upon all to co-operate with us in a new attempt to restrain its ravages.

Copies of this circular and also of Circulars XLIV., LXIV., &c., can be had through postal addressed

EZRA M. HUNT, M.D., *Secretary*,
TRENTON, N. J.

Reprint 1892.

LAWS.

In Circulars LX., LXVI., LXII., LIX., LXV. will be found the most important health laws, with reference to many others.

It was well urged, at a recent meeting of the New Jersey Sanitary Association, in a paper presented by Counselor Lanning, that the State system of sanitary law was far ahead of its best application and use in localities by means of well-devised ordinances and their faithful execution. While no doubt from time to time changes or additions will be needed, the main effort should be in efficient administration.

The chief health laws of the Legislature of 1891 were as follows:

LAWS OF 1891.

Chaper CCX.—A supplement to an act entitled "An act to prevent the adulteration and to regulate the sale of milk," approved March fourteenth, one thousand eight hundred and eighty-two.

Chapter CLXXVI.—A further supplement to an act entitled "An act to provide for the assessment and payment of the costs and expenses incurred in constructing sewers and making other improvements in townships and villages," approved March twelfth, one thousand eight hundred and seventy-eight.

Chapter CCXXXIII.—A supplement to an act entitled "An act for the construction, maintenance and operation of systems of sewerage in cities, towns and boroughs," approved June thirteenth, one thousand eight hundred and ninety.

Chapter XXXIX.—An act concerning townships.

Chapter CLVII.—An act relating to depositing of refuse from chemical factories near residences.

Chapter CCLXIV.—An act to amend an act entitled "An act to provide for sewerage and drainage in incorporated townships in which there is a public water-supply," passed April fourteenth, one thousand eight hundred and ninety.

Chapter LXXVI.—An act to provide for drainage and sewerage in densely-populated villages in which there is a public water-supply.

Chapter CXXX.—Supplement to an act entitled "An act to provide for sewerage and drainage in incorporated townships in which there is a public water-supply," approved April fourteenth, one thousand eight hundred and ninety.

Chapter CCVIII.—An act to amend an act entitled "An act to provide for the reconstruction of main outlet sewer heretofore constructed at the joint expense of two cities," approved March eighteenth, one thousand eight hundred and ninety.

Chapter CCIX.—A supplement to an act entitled "An act to provide for the reconstruction of main outlet sewer heretofore constructed at the joint expense of two cities," approved March eighteenth, one thousand eight hundred and ninety.

Chapter CCLXXV.—A supplement to the act entitled "A further supplement to the act entitled 'An act to regulate fees,' approved April fifteenth, one thousand eight hundred and forty-six," approved April third, one thousand eight hundred and eighty-eight. (As to pension certificates.)

MEDICAL REGISTRY.

LIST OF PRACTICING PHYSICIANS IN THE STATE, WITH THEIR LOCALITIES BY COUNTIES AND TOWNSHIPS, AND THEIR POST-OFFICE ADDRESSES.

◆

In the constant correspondence of this office and the important relations that the medical profession bears to the public health and to the returns of vital statistics, it has been found necessary to secure such a registry as enables us to be aware of the localities of medical men.

The list is very nearly complete, although it is probable that a few omissions have occurred. Of any such we will be glad to be informed, or of any errors made.

The list does not assert anything as to the individual diplomas, but is such as is furnished for each township or city.

We add to this list all who have passed the Board of Medical Examiners up to January 1st, 1892. A few of the names occur in the general list, but we are not as yet able to distribute all to the respective townships or towns in which they have settled.

ATLANTIC COUNTY.

TOWN OF ABSECON.

Name.	P. O. Address.
E. H. Madden	Absecon.
T P. Waters	"
M. S. Lyon	"
J. K. Pitney	"

ATLANTIC CITY.

Name.	P. O. Address.
L. H. Armstrong	Atlantic City.
A. W. Bailey	" "
Eli S. Beary	" "
Wm. H. Bennett	" "
Geo. W. Crosby	" "
J. A. Doughty	" "
Jno. R. Fleming	" "
Wm. B. Garside	" "
Nelson Ingram	" "
Philip Marvel	" "
Morris B. Miller	Atlantic City.
M. L. Munson	" "
B. C. Pennington	" "
W. M. Pollard	" "
J. C. Pursell	" "
Boardman Reed	" "
E. L. Reed	" "
Lewis Reed, Sr	" "
Thomas K. Reed	" "
E. A. Reiley	" "
Arnold Schott	" "
De Witt Sherman	" "
W. C. Sooy	" "
Lewis R. Souder	" "
T. J. Stanley	" "
Julius Kemmerer	" "
S. A. de Selmitz	" "
Samuel Stille	" "

ATLANTIC COUNTY—Continued.

Name.	P. O. Address.
J. B. Thompson	Atlantic City.
Bart J. Melestor	" "
M. West	" "
E. P. Williams	" "
W. Wright	" "
M. D. Youngman	" "
Wm. Macauley Powell	" "

BUENA VISTA TOWNSHIP.

(No physicians reported.)

EGG HARBOR CITY.

Name.	P. O. Address.
Theophilus H. Boysen	Egg Harbor City.
J. U. Elmer	" " "

EGG HARBOR TOWNSHIP.

(No physicians reported.)

GALLOWAY TOWNSHIP.

Name.	P. O. Address.
G. M. Harris	Port Republic.

HAMILTON TOWNSHIP.

Name.	P. O. Address.
H. C. James	Mays Landing.
J. A. Massinger	" "

TOWN OF HAMMONTON.

Name.	P. O. Address.
Edward North	Hammonton.
George F. Jahncke	"
Theo. G. Bieling	"
Godfrey M. Crowell	"
W. M. Hedges	"

MULLICA TOWNSHIP.

Name.	P. O. Address.
H. W. Smith	Elwood.

WEYMOUTH TOWNSHIP.

(No physicians reported.)

BOROUGH OF PLEASANTVILLE.

Name.	P. O. Address.
Jos. H. North, Jr	Pleasantville.
Rich'd M. Sooy	"
Garret De Mill	"

BERGEN COUNTY.

BOILING SPRING TOWNSHIP.

Name.	P. O. Address.
J. W. Phelps	Rutherford.

ENGLEWOOD TOWNSHIP.

Name.	P. O. Address.
Hardy M. Banks	Englewood.
Edward W. Clarke	"
D. A. Baldwin	"
Geo. B. Best	"
Jno. A. Wells	"
Daniel Currie	"
J. W. Terry	"
P. H. Morris	"

FRANKLIN TOWNSHIP.

Name.	P. O. Address.
E. W. Hamilton	Oakland.

HARRINGTON TOWNSHIP.

Name.	P. O. Address.
Lewis B. Parsell	Closter.
Henry A. Crary	"
Frederick Morris	Norwood.

HOHOKUS TOWNSHIP.

Name.	P. O. Address.
H. T. Elliot	Ramseys.
O. P. De Yoe	"

LODI TOWNSHIP.

Name.	P. O. Address.
Oliver Soper	Lodi.
Dr. Tygert	Carlstadt.
Dr. Mohn	"

MIDLAND TOWNSHIP.

(No physicians reported.)

NEW BARBADOES TOWNSHIP.

Name.	P. O. Address.
David St. John	Hackensack.
F. H. White	"
G. Howard McFadden	"
Chas. F. Adams	"
A. Richter	"
G. E. Brown	"
M. E. Russle	"
Dr. Ackerman	"
Dr. Harris	"
J. O. Van Winkle	"

ORVIL TOWNSHIP.

Name.	P. O. Address.
Charles W. Badeau	Allendale.

PALISADE TOWNSHIP.

Name.	P. O. Address.
John J. Haring	Tenafly.
J. M. Simpson	Schraalenburg

BERGEN COUNTY—Continued.

RIDGEFIELD TOWNSHIP.

Name.	P. O. Address.
Joseph Huger	Fort Lee.
M. S. Ayers	Fair View.
George Cosine	Bogata.
Conrad Mesgler	Ridgefield Park.
Geo. M. Oakford	" "

RIDGEWOOD TOWNSHIP.

Name.	P. O. Address.
John T. Demund	Ridgewood.
George B. Parker	"
W. L. Vroom	"

SADDLE RIVER TOWNSHIP.

(No physicians reported.)

UNION TOWNSHIP.

Name.	P. O. Address.
H. H. Hollister	Rutherford Park.
Dr. Armstrong	" "
Dr. Lamberson	Lyndhurst.
Dr. Trautwein	"
Chas. Calhoun	Rutherford.
John H. Davis	"

WASHINGTON TOWNSHIP.

Name.	P. O. Address.
Henry C. Neer	Park Didge.
Simeon J. Zabriskie	Westwood.
Eugene Jehl	Pascack.

BURLINGTON COUNTY.

BASS RIVER.

Name.	P. O. Address.
C. Garrabrant	New Gretna.

BEVERLY TOWNSHIP.

Name.	P. O. Address.
Addison W. Taylor	Beverly.
Ellsworth Adams	"
Joseph J. Currie	"
J. V. Roberts	"
Charles J. Massinger	"

BORDENTOWN TOWN AND TOWNSHIP.

Name.	P. O. Address.
Irene D. Young	Bordentown.
Wm. H. Shipps	"
James S. Gilbert	"
Edward E. French	"
Burr W. McFarland	"
Levi D. Tebo	"
G. L. Whitehead	"

CITY OF BURLINGTON.

Name.	P. O. Address.
A. O. Buck	Burlington.
J. B. Cassady	"
Walter E. Hall	"
J. Howard Pugh	"
Joseph Shreve	"
E. F. Rink	"
L. Van Renssalaer	"
E. S. Lansing	"
Franklin Gauntt	"
F. Allen Gauntt	"
W. G. Parrish	"
R. J. Waln	"

CHESTER TOWNSHIP.

Name.	P. O. Address.
N. Newlin Stokes	Moorestown.
Joseph Stokes	"
Pusey Wilson	Moorestown.
Alfred Mattson	"
Geo. B. L. Clay	"
F. G. Stroud	"
Chalkley Kille	"

CHESTERFIELD TOWNSHIP.

Name.	P. O. Address.
J. G. L. Whitehead	Crosswicks.
Chas. L. Dey	"
Elias D. Maine	Sykesville.

CINNAMINSON TOWNSHIP.

Name.	P. O. Address.
H. B. Hall	Riverton.
Alex. Marcy	"
Frances S. Janney	Cinnaminson.
J. D. Janney	"
Lippincott Sharp	Palmyra.
J. A. Vannort	"

DELRAN TOWNSHIP.

Name.	P. O. Address.
Alex. Small	Riverside.
T. S. Lippincott	"

EASTAMPTON TOWNSHIP.

(No physicians reported.)

EVESHAM TOWNSHIP.

Name.	P. O. Address.
P. V. B. Stroud	Marlton.
E. B. Sharp	"

FLORENCE TOWNSHIP.

Name.	P. O. Address.
Chas. A. Baker	Florence.
G. W. H. Calver	Columbus.
A. S. Ironside	Florence.

BURLINGTON COUNTY—Continued.

LITTLE EGG HARBOR TOWNSHIP.

Name.	P. O. Address.
M. V. Reeves................	Tuckerton.
Theophilus T. Price......	"

LUMBERTON TOWNSHIP.

(No physicians reported)

MANSFIELD TOWNSHIP.

Name.	P. O. Address.
D. G Van Marter........	Columbus.
A. Patterson................	Georgetown.
A. C. Haines...............	Columbus.

MEDFORD TOWNSHIP.

Name.	P. O. Address.
Josiah Reeve...............	Medford.
Lewis L. Sharp	"
Richard S. Braddock....	"
A. E. Zeitler...............	"

MOUNT LAUREL TOWNSHIP.

(No physicians reported.)

NEW HANOVER TOWNSHIP.

Name.	P. O. Address.
Amos Shaw................	Jacobstown.

NORTHAMPTON TOWNSHIP.

Name.	P. O. Address.
Richard C. Barrington..	Mount Holly.
Wm. P. Melcher	" "
Richard H. Parsons......	" "
Richard E. Brown.......	" "
Samuel Caley..............	" "
Wm. W. Whitehead......	" "
John W. Branin.........	" "
Geo. Vanderveer.........	" "
William Chamberlain...	" "
Jacob Grigg..........	" "

PEMBERTON TOWNSHIP.

Name.	P. O. Address.
E. Hollingshead..........	Pemberton.
Dr. Lane.....................	"
Dr. Woodruff	"

RANDOLPH TOWNSHIP.

Name.	P. O. Address.
John E. Carey............	Lower Bank.

SHAMONG TOWNSHIP.

(No physicians reported.)

SOUTHAMPTON TOWNSHIP.

Name.	P. O. Address.
J. C. Brown.................	Vincentown.

SPRINGFIELD TOWNSHIP.

(No physicians reported.)

WASHINGTON TOWNSHIP.

(No physicians reported.)

WESTAMPTON TOWNSHIP.

(No physicians reported.)

WILLINGBORO TOWNSHIP.

Name.	P. O. Address.
W. L. Martin...............	Rancocas.
Franklin T. Haines......	"

WEYMOUTH TOWNSHIP.

(No physicians reported.)

WOODLAND TOWNSHIP.

(No physicians reported.)

CAMDEN COUNTY.

CAMDEN.

Name.	P. O. Address.
Purnell W. Andrews.....	Camden.
Sam'l F. Ashkraft........	"
J. D. Baer..................	"
P. W. Beale................	"
F. A. Bean.................	"
D. Benjamin...............	"
Thos. R. Blackwood......	"
H. G. Bonwill.............	"
Walter S. Bray............	"
O. W. Braymer............	"
Sam'l Carles...............	"
Rob't Casperson...........	Camden.
E. A. Claire................	"
W. T. Collins..............	"
C. J. Cooper................	"
H. H. Davis	"
N. Davis..	"
Wm. A. Davis.............	"
A. T. Dobson...............	"
Jno. W. Douges...........	"
Jno. G. Doran............	"
W. G. Dubois.............	"
Wilfred Dupont...........	"

CAMDEN COUNTY—Continued.

Name.	P. O. Address.
F. W. Eaton	Camden.
M. L. Emrick	"
Jas. P. Finlan	"
Geo. R. Fortiner	"
Ida F. Fortiner	"
Joel W. Fithian	"
J. Howard Frick	"
E. L B. Godfrey	"
Annie E. Griffith	"
Wesley Grindle	"
Grulford Gunter	"
O. B. Gross	"
R. T. Haines	"
Walter G. Hammel	"
Louis Hasson	"
Geo. W. Henry	"
Conrad G. Howell	"
E. M. Howard	"
Aaron Howell	"
F. L. Horning	"
I. N. Hugg	"
H. P. Hunt	"
W. H. Hunt	"
Wm. H. Ireland	"
S. B. Irwin	"
Wm. H. Iszard	"
Harry Jarrett	"
Wm. S. Jones	"
Jno B. Longshore	"
J. L. Lane	"
J. F. Leavitt	"
Jno. D. Leckner	"
Benj S. Lewis	"
A. Marcy	"
Wm. Martin	"
Alex. M. Mecray	"
M. F. Middleton	"
Wm. S. Mosslander	"
A. McAlister	"
Wm. F. H. Osman	"
H. P. Palm	"
F. P. Pfieffer	"
Wm. R. Powell	"
Sophia Presley	"
Silas H. Quint	"
Geo. F. Ralston	"
Rufus Reed	"
R. W. Richie	"
Jas. M. Ridge	"
Geo. T. Robinson	"
Thos. G. Rowand	"
C. M. Schellinger	"
Wm. Schafer	"
Wm N. Sher	"
E. R Smiley	"
S B. Smith	"
Charles Souder	"
Jas. G. Stanton	Camden.
Jas. H. Stanton	"
Jacob F. Stock.	"
V. R. Stone	"
Dan'l Strock	"
H. Genet Taylor	"
R. G. Taylor	"
E P. Townsend	"
E. R. Tullis	"
C. J. Wallace	"
M. West	"
J. Orlando White	"
W. White	"
F. E. Williams	"
W. C Williams	"
J. J. Wills	"
J. H. Wills	"
Geo. D. Woodward	"

CENTRE TOWNSHIP.

Name.	P. O. Address.
Benj. Climonson	Mount Ephraim.

DELAWARE TOWNSHIP.

Name.	P. O. Address.
Elijah B. Woolston	Marlton.

CITY OF GLOUCESTER.

Name.	P. O. Address.
Henry A. M. Smith	Gloucester City.
James A. Wamsley	" "
Duncan W. Blake	" "
Edwin Tomlinson	" "
John K. Bennett	" "
John J. Haley	" "
S. C. Ross	" "
W. L Delap	" "
Wm. McBride	" "
Richard Gardiner	" "

GLOUCESTER TOWNSHIP.

Name.	P. O. Address.
Henry E. Branin	Blackwood.
Jos. E. Hurff	"

HADDON TOWNSHIP.

Name.	P. O. Address.
C. H. Shivers	Haddonfield.
B. H. Shivers	"
F. E. Williams	"
W. B. Jennings	"
J. R. Stevenson	"
L. L. Glover	"
W. S. Long	"
H. B. Miller	"
Edward H. Megill	"

STOCKTON TOWNSHIP.

Name.	P. O. Address.
James A. George	N. Cramer Hill.
Jerome L. Artz	Cramer Hill.

CAMDEN COUNTY—Continued.

Name.	P. O. Address.
H. H Shirk	Cramer Hill.
Wm H. Kensinger	N. Cramer Hill.
J. B. Davis	Cramer Hill.
L. Reese	" "
D. H. Bartine	Merchantville.
J. M Hinson	"
John W. Marcy	"
Chas Jennings	"

WINSLOW TOWNSHIP.

(No physicians reported.)

WATERFORD TOWNSHIP.

Name.	P. O. Address.
D. M. Stout	Berlin.
Wm. Westcott	"
Wm. Raughley	"
Dr. Hoovender	"

CAPE MAY COUNTY.

CAPE MAY CITY.

Name.	P. O. Address.
Jas. Mecray	Cape May City.
Virgie M. D. Marcy	" " "
Alonzo L. Leach	" " "
E. H. Phillips	" " "
Emlen Physick	" " "

DENNIS TOWNSHIP.

P. M. Way	Ocean View.
Eugene Way	Dennisville.

LOWER TOWNSHIP.

Eli B. Wales	Cold Spring.
Louise L. Wylie	Cape May Point.

MIDDLE TOWNSHIP.

Name.	P. O. Address.
James M. Slaughter	Rio Grande.
Wilson R. Lake	Green Creek.
John H. Hand	Dias Creek.
Isaac M. Downs	Cape May C. H.
Julias Way	" " "
Jonathan F. Leaming	" " "
Humphry Swain	Goshen.
Dr. Hutchinson	Wildwood.

OCEAN CITY.

Jas. E. Pryor	Ocean City.
J. S. Waggoner	" "

UPPER TOWNSHIP.

Joseph C. Marshall	Tuckahoe.
Randolph Marshall	"
Benjamin T. Abbott	"

CUMBERLAND COUNTY.

BRIDGETON.

Name.	P. O. Address.
Hamilton Mailly	Bridgeton.
J. C. Applegate	"
Theo G Davis	"
Henry W. Elmer	"
Matthew K. Elmer	"
Geo. A Harris	"
John H. Moore	"
David H. Oliver	"
J. Barron Potter	"
J. H. Putnam	"
Jacob G. Streets	"
David R. Streets	"
Thos J. Smith	"
Joe Sheppard	"
John R C. Thompson	"
Mrs. L. M. Putnam	"

DEERFIELD TOWNSHIP.

Name.	P. O. Address.
Charles C. Phillips	Deerfield.
Rulon Dare	"
E. E. Howard	Rosenhayn.

DOWNE TOWNSHIP.

A. P. Glandon	Newport.
Charles T. Hill	"

FAIRFIELD TOWNSHIP.

Wm. D. Straughn	Fairton.

GREENWICH TOWNSHIP.

Thomas E. Slathams	Greenwich.
Ephraim Holmes	"

CUMBERLAND COUNTY—Continued.

HOPEWELL TOWNSHIP.

Name.	P. O. Address.
Charles H. Dare	Shiloh.
Geo. M. Paullen	"
John G. Sweeney	"

CITY OF VINELAND, LANDIS TOWNSHIP.

Chas. R. Wiley	Vineland.
Judson L. Bech	"
Orange H. Adams	"
Edwin H. Bidwell	"
Chas Brewer	"
A. C. Taylor	"
Mrs. M. E. Ford	"
Waldo F. Sawyer	"
Emory B. Fuller	"
Wm. H. Martin	"
Louis Cooper	"
Henry Esten	"
Arthur Dare	"

LAWRENCE TOWNSHIP.

Name.	P. O. Address.
Enos Blackwell	Cedarville.
Ephraim Bateman	Cedarville.
W. P. Glenden	"

MAURICE RIVER TOWNSHIP.

J. Howard Willets	Port Elizabeth.
Stacy M. Wilson	Susburg.
Joseph Butcher	Heislerville.

CITY OF MILLVILLE.

J. S. Whitaker	Millville.
W. L. Newell	"
W. H. C. Smith	"
J. W. Wade	"
T. C. Wheaton	"
Jos. C. Wheaton	"
C. H. Hubbard	"
Edwin H. Jones	"
Chas. B. Neal	"

STOE CREEK TOWNSHIP.

Joseph Tomlinson	Roadstown.

ESSEX COUNTY.

BELLEVILLE TOWNSHIP.

Name.	P. O. Address.
D. M. Skinner	Belleville.
A. M. Clark	"
C. H. Winans	"

BLOOMFIELD TOWNSHIP.

Wm. H. White	Bloomfield.
Edwin M. Ward	"
Chas. H. Bailey	"
Wm. H. Van Gieson	"
John E. Wilson	"

CALDWELL TOWNSHIP.

Edw. E. Peck	Caldwell.
Edwin B. Laine	"
H. B. Whitehorne	Verona.

CLINTON TOWNSHIP.

M. Osborne Christian	Irvington.
Joseph Wade	"
W. Pennington	"

EAST ORANGE TOWNSHIP.

Name.	P. O. Address.
Ralph Blakelock	East Orange.
G. Clinton Blakelock	" "
T. B. Chambers	East Orange.
Alice D. Condict	" "
Wm. H. Davis	" "
Elisabeth J. T. Gould	" "
Walton D. Garrett	" "
Francis A. Gile	" "
Chas. A. Groves	" "
Thos. N. Gray	" "
Richardson Gray	" "
Wm. B. Graves	" "
W. K. Gray	" "
Wm. D. Robinson	" "
Geo. B. Dowling	" "
Winthrop D. Mitchell	" "
Eliza B. Phelps	" "
Francis A. Lane	" "
C. H. Hadley	" "
Milton Baldwin	" "

FRANKLIN TOWNSHIP.

George B. Philhower	Nutley.
A. H. Van Riper	"
Henry D. White	"

LIVINGSTON TOWNSHIP.

(No physicians reported.)

ESSEX COUNTY—Continued.

MILLBURN TOWNSHIP.

Name.	P. O. Address.
E. English	Millburn.
Wellington Campbell	"

MONTCLAIR TOWNSHIP.

John J. H. Love	Montclair.
John W. Pinkham	"
Richard P. Francis	"
Richard C. Newton	"
Levi W. Case	"
James S. Brown	"
Clarence W. Butler	"
Chas. H. Shelton	"
Andrew L. Nelden	"
Morgan W. Ayres	"
A. E. Dickinson	"
Henry Power	"

CITY OF NEWARK.

Name.	P. O. Address.
Henry J. Anderson	Newark.
Wm. J. Andrews	"
John L. Adams	"
H. Allers	"
C. Bachmann	"
Walter S. Baker	"
Aaron K. Baldwin	"
T. H. Baldwin	"
Solomon Baruch	"
E. D. Bemiss	"
F. W. Becker	"
W. E. Baldwin	"
C. D. Bennett	"
A. J. Bassboger	"
Herman C. Bleyle	"
E N. Bliss	"
Wm. Bailey	"
George E. Babbitt	"
Ed. De L. Bradin	"
Rudolf Braun	"
J D Brumley	"
W. R Bruyere	"
C. S. Baker	"
James B. Burnet	"
F. W. Becker	"
Robert L. Burrage	"
A. L Calabrese	"
W. E. Carroll	"
J. Henry Clark	"
Henry L Coit	"
E. A. G. Conkling	"
Jas. W. Collins	"
Joseph A. Corwin	"
R. W. Chapman	"
Theodore W. Corwin	"
James H. Cummins	"
H. B. Crane	Newark.
J. P. Campbell	"
M. S. Crane	"
John S. Candee	"
Arthur N. Curtis	"
Chas. Dehlbach	"
John N. Dehart	"
Laban Dennis	"
R. G. P. Diffenbach	"
Daniel M. Dill	"
William S. Disbrow	"
M. O. F. Dolphin	"
Arthur C. Dougherty	"
Charles J. Duffy	"
Charles H. Duncker	"
Frederick W. Duncker	"
John F. Duncker	"
W. P. Eagleton	"
John L. Duryee	"
William J. Eccles	"
D. J. & T. P. Edwards	"
Emma W. Edwards	"
Jules Egge	"
Daniel Elliot	"
James Elliot	"
Lucy S. Evarts	"
Edward Everitt	"
Joseph Fewsmith	"
A. Frey	"
Frederick Friess	"
Charles H. Frings	"
S. H. Frazer	"
R. S. Gage	"
Henry Frankindorf	"
Hilmer J. Galuba	"
Robert F. Gillen	"
Holden E Goldberg	"
Emil E. Guenther	"
William Glatzmayer	"
Anna M. Graves	"
Frank Gruber	"
John F. Hagar	"
Albert J Hahn	"
Eleanor Haines	"
Clara Hampson	"
G W. Harman	"
Hans Haux	"
Dr. Hinckley	"
Joseph H. Haydon	"
Edward H. Hammill	"
John H. Hedden	"
Joseph Hedges	"
Hugh C. Hendry	"
E. M. Q Hawkes	"
Henry T. Herold	"
H. C. H. Herold	"
C. W. Harrison	"

ESSEX COUNTY—Continued.

Name.	P. O. Address.
Peter V. P. Hewlett	Newark.
W. E. Hitchcock	"
Fred. Hexahammer	"
J. A. Hoffman	"
Edgar Holden	"
L. Eug. Hollister	"
E. J. Howe	"
E P. Iliff	"
Charles L. Ill	"
Edward J. Ill	"
J. Ely Janes	"
Jotham C. Johnson	"
William M. Johnson	"
S Wasson Jones	"
W. A. Judson	"
George R. Kent	"
Charles J. Kipp	"
Dr Krause	"
Harriet L. Knudsen	"
Alex. Kunstlick	"
Henry A. Kornemann	"
Dr. Krantz	"
T W. Lauterborn	"
W H C Lee	"
Charles Lehlbach	"
C. F. J. Lehlbach	"
F Lehmacher	"
John J. Leppa	"
Thomas W Loweree	"
Henry Mahr	"
William Martland	"
Fred B. Mandeville	"
Fred. A. Mandeville	"
Sarah R Mead	"
George Meeker	"
Archibald Mercer	"
R. B Mershon	"
F. L. Meyers	"
D. J. C. Morgan	"
Alexander Morison	"
Edward Mueller	"
Charles Mueller	"
H. D. McCormick	"
D D. Mulcahy	"
J K. Mulhollan	"
Frederick C Nadler	"
Vincent Nager	"
Albert B Nash	"
Theodore Neuman	"
E D. Newman	"
George O'Gorman	"
William O'Gorman	"
C. Herbert Osborne	"
J. D Osborne	"
Charles B Parker	"
S. H. Pennington	"
A. C. Peters	"
W. N. Pindell	Newark.
G. E. Potter	"
John Pringle	"
John M. Rand	"
William Rankin, Jr	"
Jacob Rau	"
Joshua W. Read	"
John W. Reid	"
Philippe Ricord	"
Nicolo Rivellini	"
Samuel E. Robertson	"
M. N. Robinson	"
Hugh P. Roden	"
Philip Roth, Jr	"
E. Emory Rothe	"
Ernest Schoffler	"
Albert J. Schureman	"
Charles A. Schureman	"
Emanuel Schwartz	"
Edward Sealy	"
Marcus Seidmann	"
Wm. F. Seidler, Jr	"
Daniel Winans Smith	"
E. Fayette Smith	"
William A. Smith	"
W. Schilling	"
Smith & Lyon	"
B. H. B. Sleght	"
Lott Southard	"
M. F. Squier	"
Rob't G. Stanwood	"
E Swartz	"
J. S. Sutphen	"
R. M. Sutphen	"
Theron Y. Sutphen	"
Daniel L. Sweeney	"
Alfred Thayer	"
Hiram H. Tichenor	"
F W. Thuer	"
William Titus	"
Henry A. Towle	"
W. S. Thompson	"
George D Trumpore	"
Amunda Taft	"
C. F. Underwood	"
S W. Van Duyn	"
G. A. Van Wagenan	"
Charles Vogler	"
Peter Von Aa	"
H. Von Frankendorff	"
Ed. R. Wagner	"
David L. Wallace	"
H. J. F. Wallhauser	"
Aaron C. Ward	"
Arthur Ward	"
George S. Ward	"
William S. Ward	"

ESSEX COUNTY—Continued.

Name.	P. O. Address.
E. A. Ward	Newark.
Walter S. Washington	"
Augustus V. Wendel	"
H. N. Woolman	"
C. S. Whitehead	"
D. A. Wildeman	"
I. C. Whitehead	"
George M. Wait	"
William R. Willman	"
Frank C. Woodruff	"
James T. Wrightson	"
Alice Hamilton Ward	"
Charles Young	"
Joseph C. Young	"
Charles M. Zeh	"
Hugo Zipper	"

CITY OF ORANGE.

Name.	P. O. Address.
Wm. Pierson	Orange.
J. L Seward	"
Carl Buttner	"
Jas. H. Bradshaw	"
Eugene Tresler	"
Thos. W. Harvey	"
Geo. C. Bayles	"
Frank J. Tetreault	"
O. M. Conant	"
F. M. Deems	"
Wm. A. Durrie	"
Thos. S. Fitch	Orange.
H. P. Gerbert	"
C. A. Groves	"
Wm. H. Holmes	"
H. E. Matthews	"
Laura M. Wright	"
Wm. P. Vail	"
Joseph W. Stickler	"
Sarah C. Spottiswoode	"
M. H. Simmons	"
G. H. Richards	"
G. W. Richards	"
T. F. Phelan	"
Edgar V. Moffat	"
Frank C. Bruin	"

SOUTH ORANGE TOWNSHIP.

Name.	P. O. Address.
Wm. J. Chandler	South Orange.
A. A. Ransom	" "
Mefford Runyon	" "
Lucy S. Forbes	" "
H. A. Manderville	" "
Phœbe D. Brown	Hilton.

WEST ORANGE TOWNSHIP.

Name.	P. O. Address.
James M. Maghee	West Orange.
Bethuel W. Dodd	" "

GLOUCESTER COUNTY.

CLAYTON TOWNSHIP.

Name.	P. O. Address.
Samuel S. Fisler	Clayton.
H. G. Buckingham	"
Alfred Porch	"
Charles L. Duffell	"

DEPTFORD TOWNSHIP.

Name.	P. O. Address.
Harry A. Stout	Wenonah.
Geo. W. Bailey	"

FRANKLIN TOWNSHIP.

Name.	P. O. Address.
A. A. Smith	Malaga.

EAST GREENWICH TOWNSHIP.

(No physicians reported)

GLASSBORO TOWNSHIP.

Name.	P. O. Address.
J. Down Heritage	Glassboro.
Jacob Iszard	Glassboro.
Howard Iszard	"
M. J. Luffberry	"
Seymore Wescott	"

GREENWICH TOWNSHIP.

Name.	P. O. Address.
George C. Laws	Paulsboro.
E. L. Reeves	"
R. H. Reeves	"
Wm. H. Pounds	"

HARRISON TOWNSHIP.

Name.	P. O. Address.
E E. De Groff	Mullica Hill.
John H. Ashcraft	" "

LOGAN TOWNSHIP.

Name.	P. O. Address.
E. T. Oliphant	Bridgeport.
P. E. Stilwagon	"

GLOUCESTER COUNTY—Continued.

MANTUA TOWNSHIP.

Name.	P. O. Address.
Albert Trenchard	Mantua.
E. Z. Hillegass	"
S. M. Snyder	Pitman Grove.

MONROE TOWNSHIP.

L. M. Halsey	Williamstown.
J. G. Edwards	"
Wm. R. Brick	"

SOUTH HARRISON TOWNSHIP

S. F. Stanger	Harrisonville.

WASHINGTON TOWNSHIP.

Cyrus B. Phillips	Hurffville.

WEST DEPTFORD TOWNSHIP.

(No physicians reported)

CITY OF WOODBURY.

Name.	P O. Address.
Clarence G. Abbott	Woodbury.
Henry C. Clark	"
H. B. Diverty	"
W. A. Glover	"
Wallace McGeorge	"
T. E. Parker	"
George Evans Reading	"
H. A. Wilson	"
Henry H. Clark	"

WOOLWICH TOWNSHIP.

Luther F. Halsey	Swedesboro.
Benj. F. Buzby	"
E. B. Sharp	"
O. Grimshaw	"

HUDSON COUNTY.

Name.	P. O. Address.
B. A. Andrew	Jersey City.
H. T. Adams	" "
Ulamor Allen	" "
Clovis Adam	" "
D. R. Atwell	" "
Henry Allers	Harrison.
W. J. Arlitz	Jersey City.
M. S. Ayers	Fairview, Bergen county.
E P. Buffett	Jersey City.
Horace Bowen	" "
J. B. Burdett	" "
Eleazer Bowen	" "
H. Mortimer Brush	Bayonne.
H. G. Bidwell	Jersey City.
Fred. W. Briegleb	" "
R. Belmer	" "
Louis Baumann	" "
J. S. Briggs	" "
Wm. S. Boyd	" "
P. W. Barber	Kearny Twp.
J. J. Bauman	Jersey City.
Henry J. Bogardus	" "
Ed. L. Bull	" "
Thomas Byrnes	Town of Union.
L. D Broughton	Jersey City.
S. E. Bondy	Bayonne.
Carl De Wolf Brownell	Jersey City Hospital.
Maria H Broxhaus	Hoboken.
Horace Bowen	Jersey City.
Denis W. Barry	Hoboken.
Nathan G. Bozeman	New York.

Name.	P. O. Address.
Jno. J. Broderick	Jersey City.
H. H. Burnette	Hoboken.
M. Edith H. Banch	Jersey City.
E. Mills Baker	" "
Frank T. Brow	Bayonne.
Wm. M. Brien	Jersey City.
Oliver R. Blanchard	" "
Alexander Beck	Arlington.
R. F. Chabert	Hoboken.
C. H. Case	Jersey City.
J. E. Culver	" "
W. J. Cadmus	" "
C. B. Converse	" "
W. A. Clark	" "
C. W. Cropper	" "
D. W. Culver	" "
A. H. Clark	Kearny Twp.
S. W. Clark	Jersey City.
Fred. M. Corwin	Bayonne.
B. P Craig	Jersey City.
A. J. Carpenter	" "
E. A. Cudlipp	" "
E. H Congdon	" "
Joseph J. Craven	" "
Bernard Clausen	Hoboken.
John Connell	Jersey City.
Walter J. Clark	" "
Harvey R. Cronk	New York.
Jas. E. Cosgrove	Bayonne.
Deborah V. Clute	New York.
Ephraim De Groff	Town of Union.
N. R. Derby	Bayonne.
M. F. De Hart	Jersey City.

HUDSON COUNTY—Continued.

Name.	P. O. Address.
G. K. Dickinson	Jersey City.
W. A. Durrie, Jr	" "
Alexander Dallas	Bayonne.
E. J. Deraismes	Town of Union.
W. L. Darlington	" " "
John W. Doherty	Jersey City.
M. O'F. Dolphin	Harrison.
Arthur D. De Long	Jersey City.
James Davies	" "
H. S. Drayton	" "
Morris Drossner	" "
Lucius F Donohue	Bayonne.
Jos. M. Doyle	Jersey City.
John R Everett	" "
L. W. Elder	Hoboken.
J. A. Exton	Kearny Twp.
W. T. Elmore	Jersey City.
Benj. Edge	" "
S. R. Forman	" "
W. R. Fisher	Hoboken.
J. F. Finn	Jersey City.
J. T. Field	Bayonne.
Johannes Faber	Jersey City.
N. Foote	" "
Henry G. Fish	Newark.
John H. Finnerty	Jersey City.
Julius Fehr	Hoboken.
S. E. Fernold	Jersey City.
J. E. Fopeano	Hoboken.
W. F. Faison	Jersey City.
Jos. W. Finerty	" "
Jas. N. Faulkner	Hoboken.
Nelson Fanning, Jr	Jersey City.
Zachary Peck Fletcher	" "
R. B. Gilman	" "
L J. Gordon	" "
F. D Grey	" "
L. V. Guerin	" "
W. Griswold	" "
R. W. Gelback	Hoboken.
L G. Goode	Jersey City.
Francis B. Grew	Hoboken.
J. H. Graham	New York
Eugene H. Goldberg	Kearny.
D. T. Gray	Jersey City.
James E. Gray	" "
Wm. C. Gallagher	" "
Josiah Hornblower	" "
T. R. Hornblower	" "
D S. Hardenberg	" "
A. V. Hill	Guttenberg.
A. J. Holcombe	Jersey City.
S. A. Helfer	Hoboken.
Melissa Hinchman	Jersey City.
H W A Haase	" "
Peter Hoffman, Jr	" "
J P. Henry	" "

Name.	P. O. Address.
Jas. Hoffman	Jersey City.
P. Hommell	" "
C. Percy Hopper	" "
H. J. Holcombe	" "
Willard Hillegar	" "
Henry D. Holt	" "
Alfred W. Herzog	Hoboken.
S. A. Hollister	Jersey City.
C. L. Humphrey	" "
Richard Henning	" "
Chas. D. Hill	" "
Harry Hawlik	" "
Geo. W. Harder	" "
Mary E Hennessy	New York City.
F. C. Heppenheimer	" " "
Max Hecht	West Hoboken,
C. L. G. Hoening	" "
Roy Inglis	Jersey City.
C. E Jaeckel	" "
Wm. F. Jones	" "
Fred. L. Johnson	" "
Wm. A. Judson	Town of Union.
Matilda A. Jardine	" " "
John Kudlich	Hoboken.
Adolph Kirsten	Jersey City.
John Keating	" "
Wm. T. Keeler	New York.
Geo. W. King	Snake Hill.
W. T. Kudlich	Hoboken.
Calvin F. Kyte	Jersey City.
T. Harris Kirk	Hoboken.
E. F. Kopetschny	Jersey City.
O. E. Kopetschny, Jr	" "
Gertrude B. Kelly	Hoboken.
A. C Kammerer	"
Richard Kuehne	Jersey City.
Arthur Kahn	" "
John S. Kelly	" "
W. H. Keller	Bayonne.
A. A. Lutkins	Jersey City.
M. Lampson	" "
E. J. Lowenthal	Hoboken.
John Lochner	Jersey City.
W. C. Lutkins	" "
Henry H. Lynch	" "
E. H. Linnell	Hoboken.
Albert J. Lignot	Jersey City.
H. L. Lockwood	" "
A. J. Loomis	" "
John T. Luck	Town of Union.
E. P. Luce	Bayonne.
C. A. Limeburner	Jersey City.
W. C. Lewis, Jr	" "
Geo. W La Vence	" "
Joseph W Love	" "
T. F. Morris	" "
Daniel Murray	" "

HUDSON COUNTY—Continued.

Name.	P. O. Address.
John Mohns	Town of Union.
Louis Michel	West Hoboken.
S. V. Morris	Jersey City.
S. I. Myers	Bayonne.
A. T. Muzzy	Jersey City.
Ed. Muller	Hoboken.
Christian Mohns	Town of Union.
A. C. Muttart	Jersey City.
J. W. MacMillan	" "
Geo. F. Maerker	Newark.
T. D. MacRae	Harrison.
Euphemia J. Myers	New York.
J. D. Montmarquet	Jersey City.
Edward M. Merrins	" "
Mary E. Mitchell	" "
Edward Mulvany	" "
J. D. McGill	" "
T. J. McLaughlin	" "
C. Holmes McNeil	" "
D. McClellan	West Hoboken.
W. J. McDowell	Jersey City.
Geo. D. McGauran	New York City.
Andrew McFarlane	Jersey City.
Jno. J. McLean	" "
Geo. E McLaughlin	" "
Edw. B Meisgeier	West Hoboken.
W. H. Newell	Jersey City.
F E. Noble	" "
Frank Nichols	Hoboken.
J. L. Nevin	Jersey City.
H. L. Norris	West Hoboken.
R. G. Nolan	Bergen Point.
Jno. J. Nevin	Jersey City.
H. F. Nichols	Hoboken.
Jennie W Newell	Jersey City.
Andrew L. Nelden	" "
A. J. Nabers	Bayonne.
W. R. Nevin	Jersey City.
T. C. O'Callaghan	" "
L. F. Ossa	New York City.
L. A. Opdyke	Jersey City.
Patrick O'Sullivan	" "
Chas. Pomeroy Opdyke	" "
E. W. Pyle	" "
R. M. Petrie	" "
J. J. Prendergast	Brooklyn.
John Pindar	Hoboken.
James Paul	Jersey City.
F. W. Pettigrew	" "
R W. Peacock	" "
F. G. Payn	Bayonne.
Fred G. Pitts	Hoboken.
Gotthold Pape	"
W. J Parker	Jersey City.
C. E Putman	" "
W. L. Pyle	" "
John Pringle	Kearny Twp.

Name.	P. O. Address.
Nathan J. Paddock	Jersey City.
August Chas. Pfenning	West Hoboken.
D. B. Pindar	Hoboken
Geo. E. Potter	Jersey City.
Louis Eben Poole	" "
J. W. Quimby	" "
H. E. Rothe	Harrison.
H. B. Rue	Hoboken.
J. H. Rosenkrans	"
Jno. W. Reid	Kearny Twp.
W. H. Russell	Jersey City.
T. C. Rhoads	Hoboken.
W. F. Radue	Jersey City.
D. L. Reeve	" "
Herm. J. Rechard	" "
A. G. Renwick	" "
Jay H. Radley	Hoboken.
Jos. G. Rooney	Weehawken.
S. V. W. Stout	Jersey City.
M. F. Squier	Harrison.
G. D. Saltonstall	Hoboken.
Fred. Selnow	Jersey City.
Noah Sanborn	Bayonne.
H. R. Simmons	Jersey City.
P. M. Senderling	" "
F. Straughn	" "
H. Melville Smith	" "
J E. Salter	Bayonne.
H. D. Sherwood	Jersey City.
Hugo Senftleben	" "
Fennimore C. Smith	Guttenberg.
C. I Simon	Hoboken.
Fred. Spring	Bergen Point (Bayonne).
Richard Schlemm	Town of Union.
E. T. Steadman	Hoboken.
J. A. Stegmair	Jersey City.
G. E. Steel	" "
Chas, F. Snyder	" "
A. L. W. Stephenson	New York City.
John J. Sutton	Bayonne.
Geo. M. Silvers	Jersey City.
Theo. Schindeler	Hoboken.
Francis W. Shain	Jersey City.
M. G. Simpson	" "
Hulda G. Smith	" "
Matthew J. Smith	" "
Adolph H. Schonger	New York.
Richard J. Schofield	Jersey City.
Edward Sutton	Bayonne.
Jas. L. Shiland	"
Ernest C. Schultze	Hoboken.
Geo. H. Sexsmith	Jersey City.
G. N. Tibbles	" "
Paul J. Taylor	Hoboken.
Julian P. Thomas	Jersey City.
Henry A. Towle	Newark.

HUDSON COUNTY—Continued.

Name.	P. O. Address.
A. F. Van Horn	Jersey City.
J. H. Vondy	" "
W. W. Varick	" "
J. P. Van Horne	" "
Hamilton Vreeland	" "
J. Vander Back	Guttenberg.
John D. Van Saun	Jersey City.
B. Vallarino	New York City.
B A. Watson	Jersey City.
W. Perry Watson	" "
T. F. Wolfe	" "
James Wilkinson	" "
W. P. Watson	" "
George Wilkinson	" "
W. P. Ware	" "
Conrad Wienges	" "
John Williams	Kearny Twp.

Name.	P. O. Address.
Joseph Wolfson	Jersey City.
A. W. Warden	Weehawken.
Jas. E. Weeks	Jersey City.
Chas. F. Wolff	Town of Union.
Mary A. Willis	Jersey City.
W. S. Wilson	" "
H. S. Warwick	" "
Thompson Whalley	" "
T. D. Williams	" "
Jno. E. West	" "
Louis Wolfstvin	Hoboken.
A. P. Walter	Jersey City.
Walter Wilkinson	" "
Otto A. Weigand	Hoboken.
Guillianne A Zabriskie	New York City.
Otto Ziegenhorn	Hoboken.

HUNTERDON COUNTY.

ALEXANDRIA TOWNSHIP.

Name.	P. O. Address.
M. D. Knight	Little York.
H. Race	Pittstown.

BETHLEHEM TOWNSHIP.

Name.	P. O. Address.
G. M. Pidcock	Bloomsbury.
Thomas E. Hunt	Glen Gardner.
Edgar Hunt	" "
Wm. R. Little	Bloomsbury.
A. C. Smith	"
Howard Servis	Junction.
Robert Fenwick	"

CLINTON TOWNSHIP.

Name.	P. O. Address.
Willard E. Berkaw	Annandale.
Joseph A. Stites	Lebanon.

CLINTON BOROUGH.

Name.	P. O. Address.
S. Van Sickle	Clinton.
Wm. Knight	"
W. C. Warrington	"
A. Jacobus	"

DELAWARE TOWNSHIP.

Name.	P. O. Address.
Geo V. Best	Rosemont.
Wm. E. Cornog	Sergeantsville.
John H. Fretz	Stockton.

EAST AMWELL TOWNSHIP.

Name.	P. O. Address.
Peter C. Young	Ringoes.
J. W. Silvara	"
C. W. Larison	"
Chas. F. Creveling	Reaville.
A. M. Hart	Ringoes.

FRANKLIN TOWNSHIP.

Name.	P. O. Address.
Q. E. Snyder	Quakertown.

BOROUGH OF FRENCHTOWN.

Name.	P. O. Address.
A. B. Nash	Frenchtown.
E. K. Denny	"
W. F. Finney	"
Dr. Harmon	"

HIGH BRIDGE TOWNSHIP.

Name.	P. O. Address.
William C. Alpaugh	High Bridge.
William Hacket	" "

HOLLAND TOWNSHIP.

Name.	P. O. Address.
J. N. Lowe	Milford.
Geo. Ribble	"

KINGWOOD TOWNSHIP.

Name.	P. O. Address.
E. D. Leidy	Baptisttown.

CITY OF LAMBERTVILLE.

Name.	P. O. Address.
Geo L. Romaine	Lambertville.
Edw'd W. Closson	"
Peter McGill	"
George P. Swift	"
Walter W. Nayler	"
Jas. E. Stiles	"
Geo. H. Larison	"
Frank W. Larison	"
Clarence T. Kurtz	"

HUNTERDON COUNTY—Continued.

Name.	P. O. Address.
LEBANON TOWNSHIP.	
Theodore B. Fulper	Glen Gardner.
Terrence M. A. Herron	Junction.
RARITAN TOWNSHIP.	
J. H. Ewing	Flemington.
W. H. Schenk	"
Geo. R Sullivan	"
A. Parish	"
O. H. Sproul	"
Eugene Garretson	Reaville.
J. V. Robbins	Flemington.
T. B. J. Burd	"
READINGTON TOWNSHIP.	
W. W. Pursell	White House Station.
J. V. Johnson	White House Station.
Thomas Johnson	Readington.
Jno. D. Stiger	Stanton.
Geo. W. Barton	Three Bridges.
James D. McCanley	Centreville.
TEWKSBURY TOWNSHIP.	
Henry H. Miller	Mountainville.
Thecdore Miller	Califon.
F. L. Johnson	Pottersville.
F. A. Apgar	New Germantown.
UNION TOWNSHIP.	
N. B. Boleau	Jutland.

WEST AMWELL TOWNSHIP.

(No physicians reported)

MERCER COUNTY.

Name.	P. O. Address.
EAST WINDSOR TOWNSHIP.	
L Wilbur	Hightstown.
W. L. Wilbur	"
Geo. E. Titus	"
J. P. Johnson	"
Geo H. Franklin	"
EWING TOWNSHIP.	
John W. Ward	Trenton.
John Kirby	"
HAMILTON TOWNSHIP.	
George R. Robbins	Hamilton Square
HOPEWELL TOWNSHIP.	
Jno. A. Miller	Hopewell.
Edw'd P. Hawke	"
Israel Hart	Pennington.
Edgar Hart	"
E. L. Welling	"
Wm. Radcliffe	Woodsville.
O. G. Sands	Titusville.
LAWRENCE TOWNSHIP.	
E. De Witt	Lawrenceville.
Dr. Johnson	"
PRINCETON TOWNSHIP.	
J. G. Bayles	Princeton.
E H. Bergen	"
A. K. Kline	Princeton.
O. H. Bartine	"
A. K. Macdonald	"
J H. Wikoff	"
Wm. J. Lytle	"
CITY OF TRENTON.	
Richard R. Rogers	Trenton.
Cornelius Shepherd	"
David Warman	"
Lyman Leavitt	"
Wm. W. Wyckoff	"
H. Waldburg Coleman	"
William Elmer	"
Thos. H. Mackenzie	"
William S. Lalor	"
Chas. H. Dunham	"
William Rice	"
Wm. A. Clark	"
Wm. B. Van Duyn	"
Rob't C. Hutchinson	"
Ezra M. Hunt.	"
Henry M. Weeks	"
Chas. B. Leavitt	"
Chas. H. McIllwaine	"
Horace G. Wetherill	"
Wm. McD. Struble	"
Elmer H. Rogers	"
Joseph B. Shaw	"
Addison H. Dey	"
Frank V. Cantwell	"

MERCER COUNTY—Continued.

Name.	P. O. Address.
Margaret H. Preston	Trenton.
Frank H. Williams	"
Jos. C. Boardman	"
Isaac Cooper	"
A. H. Worthington	"
Wm. G. McCullough	"
Chas. W. Gerry	"
Nelson D. Oliphant	"
Edward Kelly	"
C. F. Adams	"
H. M. Beatty	"
C. C. Brown	"
A. Coleman	"
J. W. Cooper	"
H. B Costill	"
W. H. G. Griffith	"
E. E. Hollinshead	"
M. Jenkins	"
E. W. Johnson	"
F. Johnson	"
W. McDonald	"
W. T. Rogers	"
J. H. Satterthwaite	"
J. P. Turner	"
J. D. Tantum	"
E Witte	"
J. K. Young	"
John Woolverton	"
Wm. W. L. Phillips	"
Richard R. Rogers, Jr.	"
Elmer Barwis	"

Name.	P. O. Address.
J. D. Abbott	Trenton.
A. T. Bruere	"
Dr. Burroughs	"
J. Bruyere	"
Wm. Dickinson	"
E. J. Doud	"
J. J. Encke	"
P. G. Gallagher	"
H. G. Norton	"
H. Shafer	"
G. A. Silvers	"
H. H. Sinne	"
E. R. Skellinger	"
A. C. Stokes	"
G. W. Strong	"
J. M. Wells	"
G. D Weston	"
A. Woodward	"
H. R. Worthington	"
W. Young	"
L. Satterthwaite	"
John C. Felty	"
Dennis C. Leary,	"
Wm. Watson Woolsey	"

WASHINGTON TOWNSHIP.

Geo. A. Silvers............Windsor.

WEST WINDSOR TOWNSHIP.

(No physicians reported.)

MIDDLESEX COUNTY.

CRANBURY TOWNSHIP.

Name.	P. O. Address.
H. C. Symmes	Cranbury.
J. H. Widdikes	"

EAST BRUNSWICK TOWNSHIP.

Name.	P. O. Address.
John C. Thompson	South River.
John J. Bissett	" "
C. J. W. Van Dyke	Spotswood.

MADISON TOWNSHIP.

S. M. Disbrow.............Old Bridge.

MONROE TOWNSHIP.

Name.	P. O. Address.
J. L. Suydam	Jamesburg.
H. D. Zant	"

CITY OF NEW BRUNSWICK.

Name.	P. O. Address.
Henry R. Baldwin	New Brunswick.
E. H. Barber	" "
Staats V. D. Clark	New Brunswick.
David C. English	" "
John Helm	" "
Samuel Long	" "
J. Warren Rice	" "
Patrick A. Shannon	" "
John S Van Marter	" "
Chas. U. Voohees	" "
Nicholas Williamson	" "
Edward B Young	" "
C. T. Applegate	" "
C. M. Slack	" "
A. V. N. Baldwin	" "
David Davis	" "
Franklin B. Lippincott,	" "

NORTH BRUNSWICK TOWNSHIP.

J. E. Riva.................Milltown.

MIDDLESEX COUNTY—Continued.

CITY OF PERTH AMBOY AND TOWNSHIP.

Name.	P. O. Address.
J. Glirlson	Perth Amboy.
L. S. Blackwell	" "
W. W. Hubbard	" "
W. P. Keasbey	" "
E. A. Hults	" "
H. W. Phillips	" "
Wm. E. Ramsay	" "
Dr. Wilson	" "

PISCATAWAY TOWNSHIP.

Wm. J. Nelson	New Market.
M. J. Whitford	" "
D. P. Vail	" "
P. W. Brakley	Dunellen.
H. M. Champney	"

RARITAN TOWNSHIP.

Name.	P. O. Address.
Charles H. Andrus	Metuchen.
E. B. Dana	"
A. C. Hunt	Metuchen.
W. V. McKenzie	"

SAYREVILLE TOWNSHIP.

Jesse Beekman	Sayreville.

BOROUGH OF SOUTH AMBOY.

A. Traganowan	South Amboy.
E. E. Haines	" "
E. Miller	" "
S. H. Lewis	" "
John Henry Price	" "

SOUTH BRUNSWICK TOWNSHIP.

Edgar Carroll	Dayton.

WOODBRIDGE TOWNSHIP.

Samuel E. Freeman	Woodbridge.
Samuel Harned	"
Dayton E. Decker	"
Stephen J. Keefe	"

MONMOUTH COUNTY.

ATLANTIC TOWNSHIP.

Name.	P. O. Address.
James E. Cooper	Colt's Neck.

EATONTOWN TOWNSHIP.

Wm. B. Beach	Eatontown.
Geo. H. Baker	"
W. S. Kimball	"
E. W. Beach	W. Long Branch.

FREEHOLD TOWNSHIP AND VILLAGE.

Isaac S. Long	Freehold.
Otis R. Freeman	"
D. McLean Forman	"
William M. Hepburn	"
Harry Neafie	"
James G. Maynard	"
William W. Burnett	"
Neil J. Hepburn	"

HOLMDEL TOWNSHIP.

H. G. Cook	Holmdel.

HOWELL TOWNSHIP.

Stephen M. Disbrow	Farmingdale.
Vandevere M Disbrow	"
William R. Kinmouth	"

MANALAPAN TOWNSHIP AND BOROUGH OF ENGLISHTOWN.

Name.	P. O. Address.
Asher T. Applegate	Englishtown.
George H. Hutchinson	"

MARLBORO TOWNSHIP.

J. D. Ely	Marlboro.

MATAWAN TOWNSHIP.

A. J Jackson	Matawan.
C. Knecht	"

MIDDLETOWN TOWNSHIP.

Edw. F. Taylor	Middletown.
Dan'l D. Hendrickson	"
Wm. F. Patterson	Chapel Hill.
R. F. Andrews	Navesink.
Geo. B. Labaw	"
John H. Van Mater	Atlantic Highlands.
H. A. Hendrickson	" "
Geo. D. Fay	" "
Susan Ewing	" "

MILLSTONE TOWNSHIP.

R. M. Smith	Perrineville.

MONMOUTH COUNTY—Continued.

NEPTUNE TOWNSHIP.

Name.	P. O. Address.
H. S. Kinmouth	Asbury Park.
Samuel Johnson	" "
J. A. W. Hetrick	" "
Bruce S. Keator	" "
Alex. Williamson	" "
I. N. Beegle	Ocean Grove.
R. A. Tusting	Asbury Park.
H. B. Alday	Ocean Grove.
J. H. Alday	" "
D. M. Barr	" "
G. F. Wilbur	Asbury Park.
Charles Carsner	Ocean Grove.
P. L. Tantum	" "
Mrs. Dr. Currie	" "
F. T. Alba	Bradley Beach.
Henry Mitchell	Asbury Park.
H. S. Des Anges	" "
J. H. Mackintosh	" "
Dr. Marshall	Ocean Grove.
C. Pemberton	Asbury Park.
J. T. Ackerman	" "

OCEAN TOWNSHIP AND LONG BRANCH.

Name.	P. O. Address.
H. H. Pemberton	Long Branch.
John P. Pemberton	" "
J. B. Goodenough	" "
J. O. Green	" "
G. W. Brown	" "
Chas. A. Vanderveer	" "
J. W. Taylor	" "
J. W. Bennett	" "
Henry Hughes	" "
W. E. Newing	" "
E. Thierceland	" "

RARITAN TOWNSHIP.

Name.	P. O. Address.
Joe E. Arrowsmith	Keyport.
C. H. Hamilton	"
W. E. Johnson	"
D. E. Roberts	"
E. B. Reed	Keyport.
W. W. Palmer	"
W. A. Bevins	"
G. T. Welch	"
B. W. F. Underwood	"

SHREWSBURY TOWNSHIP.

Name.	P. O. Address.
A. A. Armstrong	Fair Haven.
W. A. Betts	Red Bank.
T. A. Curtis	" "
F. T. Chadwick	" "
James S. Conover	" "
Edwin Field	" "
John Keough	" "
Geo F. Alexander	" "
T. E. Ridgeway	" "
J. E. Sayre	" "
Al. Trafford	" "
Wm. Warner	" "
Walter S. Whitmore	Oceanic and Red Bank.
Mrs Zandt	Red Bank.
J. K. Cheesman	" "
J. J. Reed	Seabright.

UPPER FREEHOLD TOWNSHIP.

Name.	P. O. Address.
T. C. Price	Imlaystown.
Geo. M. Shafer	Ocean Ridge.
H. P. Johnson	Allentown.
D. B. Pumyea	"

WALL TOWNSHIP.

Name.	P. O. Address.
Robert Laird	Manasquan.
A. A. Higgins	"
R. W. Herbert	"
J. B. Wainright	"
W. L Kinmouth	Belmar.
C. H. Thompson	"
E. Thompson	"
W. W. Trout	Spring Lake.
J. F. Davison	Glendola.
A. P. Yelvington	Manasquan.

MORRIS COUNTY.

BOONTON TOWNSHIP.

Name.	P. O. Address.
Cuthbert Wigg	Boonton.
J. G. Ryerson	"
A. E. Carpenter	"
Mrs. H. M. C. Woodruff	"

CHATHAM TOWNSHIP.

Name.	P. O. Address.
Wm J. Wolfe	Chatham.
George M. Swain	"

CHESTER TOWNSHIP.

Name.	P. O. Address.
Levi W. Case	Chester.
Alonzo Green	"
Smith E. Hedges	"

HANOVER TOWNSHIP.

Name.	P. O. Address.
E. P Cooper	Troy Hills.
H. B. Andrews	Morris Plains.

MORRIS COUNTY—Continued.

JEFFERSON TOWNSHIP.

Name.	P. O. Address.
Sylvester Utter	Woodport.

BOROUGH OF MADISON.

Name.	P. O. Address.
Calvin Anderson	Madison.
Stuart H. Reed	"
William H. Martin	"

MENDHAM TOWNSHIP.

Name.	P. O. Address.
John S. Stiger	Mendham.
I. Henry Stiger	"
George S. De Groot	"

MONTVILLE TOWNSHIP.

(No physicians reported.)

MORRIS TOWNSHIP AND MORRISTOWN.

Name.	P. O. Address.
Jos. R. Hoffman	Morristown.
J. Boyd Risk	"
A. Becker	"
A. A. Lewis	"
F. W. Owens	"
Stephen Pierson	"
P. C. Barker	"
J. H. Reily	"
J. C. Douglass	"
F. S. Bradford	"
A. Uberlacker	"
Wm. J. Parmlee	"

MOUNT OLIVE TOWNSHIP.

Name.	P. O. Address.
Chas. N. Miller	Flanders.

PASSAIC TOWNSHIP.

(No physicians reported.)

PEQUANNOCK TOWNSHIP.

Name.	P. O. Address.
Geo. A. Coates	Butler.
H. V. Day	Bloomingdale.
A. A. McWhithey	Pompton.
C. D. V. Romont	Pompton Plains

CITY OF DOVER AND TOWNSHIP OF RANDOLPH.

Name.	P. O. Address.
T. R. Crittenden	Dover.
I. W. Condit	"
Geo O. Cummins	"
R. L. Cook	"
R. A. Bennett	"
W. E. Derry	"
John J. Smith	"
Dr. Lindaberry	"
Dr. Miller	Port Oram.
H. W. Kice	" "
John Walters	" "
Miss Mary Ford	Dover.

ROCKAWAY TOWNSHIP.

Name.	P. O. Address.
John W. Jackson	Rockaway.
J. V. Menagh	"
R. C. Lunsden	"
F. W. Flagge	"
G. W. Foster	Rockaway or Port Oram.
W. Walters	Rockaway.

ROXBURY TOWNSHIP.

Name.	P. O. Address.
N. H. Adsit	Succasunna.
J. L. Taylor	"

WASHINGTON TOWNSHIP

Name.	P. O. Address.
E. C. Willett	German Valley.
Levi Farrow	Middie Valley.
John Miller	Stephensburg.
Peter S. Hann	German Valley.

OCEAN COUNTY.

BERKELEY TOWNSHIP.

(No physicians reported.)

BRICK TOWNSHIP.

Name.	P. O. Address.
D. H. Mount	Bay Head.
W. H. Katzenbach	" "
B. F. Hawley	" "
J. H. Platt	Lakewood.
H. J. Cute	"
G. S Turris	Burrsville.
H. A. Bennett	Point Pleasant.

DOVER TOWNSHIP.

Name.	P. O. Address.
R. L. Disbrow,	Toms River.
E. C. Disbrow	" "
I. C. Schureman	" "
John W. Webb	" "

EAGLESWOOD TOWNSHIP.

(No physicians reported)

OCEAN COUNTY—Continued.

JACKSON TOWNSHIP.

(No physicians reported)

LACEY TOWNSHIP.

Name.	P. O. Address.
C. R. Van Doren	Forked River.
C. B. Weaks	" "

MANCHESTER TOWNSHIP.

Irvin W. Kirk	Manchester.

OCEAN TOWNSHIP.

(No physicians reported.)

PLUMSTEAD TOWNSHIP.

Name.	P. O. Address.
William McMillen	New Egypt.
Howard Allen	" "
Charles Woodard	" "
Daniel A. Warren	" "

STAFFORD TOWNSHIP.

Samuel B. Irwin	Manahawkin.

UNION TOWNSHIP.

Edmund Bennett	Barnegat.

PASSAIC COUNTY.

ACQUACKANONK TOWNSHIP.

(No physicians reported.)

LITTLE FALLS TOWNSHIP.

Name.	P. O. Address.
M. Van Winkle	Little Falls.
J. R. M. Gedney	" "
E. A. Keeler	" "

MANCHESTER TOWNSHIP.

(No physicians reported.)

CITY OF PASSAIC.

Richard A Terhune	Passaic.
Cornelius Van Riper	"
George T. Welsh	"
Chas. A. Church	"
N. C. Ricardo	"
William H. Carroll	"
Percy H. Terhune	"
G. J. Van V. Schott	"
John Sullivan	"
J. T. Hadley	"
Edwin De Baun	"
F. F. Demarest	"
F. H. Rice	"

PASSAIC TOWNSHIP.

(No physicians reported.)

CITY OF PATERSON.

Name.	P. O. Address.
J. Henggler.	Paterson.
Walter B Johnson	"
Thomas J. Kane.	"
Henry Kip.	"
John L. Leal	"
E. S. McClellan	Paterson.
S. R. Merrill	"
C. F. W. Meyers	"
Elias J. Marsh	"
Rush Neer	"
Wm. K. Newton	"
T. F. O'Grady	"
Henry Parke	"
J. P. Paxton	"
A. W. Rogers	"
James W. Smith	"
Spencer Van Dalsen	"
C. S. Van Riper	"
Henry Withers	"
W. S. Hurd	"
T. Y. Kinne	"
P. S. Kinne	"
Davis P. Borden	"
John H. Bradsworth	"
W. F. Decker	"
F. D. Vreeland	"
James Crooks, Jr	"
John Thomas Gillson	"
Thomas Lloyd Paton	"
James F. Stewart	"
M. W Gillson	"
Geo. F. Newcombe	"
F. J. Hepworth	"
S. Cyrus Townsend	"
Frank E. Agnew	"
B. C. Magennis	"
Ada Carr.	"
A. D Jousset	"
J Solatinor	"
Willhelm C. Dittmar	"
Edward W. Doty	"
John R. Merrill	"
James Crooks	"

PASSAIC COUNTY—Continued.

Name.	P. O. Address.
James K Atkinson	Paterson.
C. Percy Hopper	"
John H. Banta	"
James S. Bibb	"
Wm. Blundell	"
Philander A. Harris	"
Geo. W. Terriberry	"
Calvin Terriberry	"
O. V. Garnett	"
D J. Bowden	"
Alexander Brown	"
Charles C. Crocker	"
George Fisher	"
William S. Green	"
A F. McBride	"
William Matzinger	"
Edward B Morgan	"
S. F. Wiley	Paterson.
Thos. B. Hopper	"

POMPTON TOWNSHIP.

J. C. Morgan	Pompton.
E. H. Wenarsey	Midvale.

WAYNE TOWNSHIP.

William Colfax	Pompton.

WEST MILFORD TOWNSHIP.

W. S Coursen	Oak Ridge.
Theodore Coursen	" "
R G Maines	West Milford.
Charles A Olcott	" "

SALEM COUNTY.

ALLOWAY TOWNSHIP.

Name.	P. O. Address.
Warren L. Ewen	Alloway.
Lemuel Wallace	"

ELSINBORO TOWNSHIP.

(No physicians reported.)

LOWER ALLOWAYS CREEK TOWNSHIP.

W. S. Smith	Hancock's Bridge.
F. B. Harris	Canton.

LOWER PENNS NECK TOWNSHIP.

Wm. H. James	Pennsville.

MANNINGTON TOWNSHIP.

(No physicians reported.)

OLDMANS TOWNSHIP.

James B. Ware	Pedricktown.
Harry T. Johnson	"
James Given	Auburn.

PILESGROVE TOWNSHIP.

Name.	P. O. Address.
L A. D. Allen	Woodstown.
Uriah Gilman	"
Ellis F. Frost	"
William Patrick	"
P. G Sowder	"
Mrs. Naomi B. Foster	"
Miss Sarah Taylor	Woodstown.
Charles Newton	Sharptown.

PITTSGROVE TOWNSHIP.

C. P. Atkinson	Palatine.
A. B. Woodruff	Elmer.
C. P. Cheeseman	"

QUINTON TOWNSHIP.

Wm. T. Good	Quinton.
David Wiley	Salem.
Francis Bilderback	"
A. T. Beckett	"
Henry Jackson	"
E. S. Sharpe	"
J. A. Patterson	"
Theo. Patterson	"
B. A. Waddington	"
Henry Chevanne	"
Quinton Gibbon	"

UPPER PENNS NECK TOWNSHIP.

Mayhew Johnson	Pennsgrove.
John H. Groff	"
John Summerhill	"
Daniel Garrison	"
David Moore	"
Henry W. Flanagan	"
Nathan H. Barnhart	"

UPPER PITTSGROVE TOWNSHIP.

M. J. Paulding	Daretown.

SOMERSET COUNTY.

BEDMINSTER TOWNSHIP.

Name.	P. O. Address.
E. F. Farrow	Peapack.
Edward Perry	"
J. B. Beekman	Pluckamin.

BERNARDS TOWNSHIP.

A. F. Voorhies	Baskingridge.
John Dayton	"
Fred. Jones	"
E. M. Stelle.	Bernardsville.
Fred. C. Sutphin	Liberty Corner.

BRANCHBURG TOWNSHIP.

A. Nelson	Neshanic Station.

BRIDGEWATER TOWNSHIP.

Name.	P. O. Address.
H G. Wagoner	Somerville.
W. J. Swinton	"
Wm. B. Mattison	"
J. F. McWilliams	"
Dr. Stilwell	"
Mary Gaston	"
T. H. Flynn	"
A. P. Hunt	"
Arthur Kenney	"
J. P. Hect	Raritan.
Dr. Dugan	"
B. B. Mathews	Bound Brook.
C. R. P. Fisher	" "
J. L. Compton	" "
C. F. Phinney	Bound Brook.
E. C. Davis	" "
E. E. Conover	North Branch.

FRANKLIN TOWNSHIP.

Fred. W. Hagerty	Bloomington.
G. G. Hoagland	Franklin Park.
Wm. B. Ribble	East Millstone.

HILLSBOROUGH TOWNSHIP.

S. O. B. Taylor	Millstone.
George Van Neste	"
Wm. H. Merrill	South Branch.
Dr. Anderson	Neshanic.

MONTGOMERY TOWNSHIP.

Jesse S. B. Ribble	Harlingen.
Abram B. Mosher	Griggstown.
Lucius D. Tompkins	Harlingen.
W. B. Searle	Rocky Hill.

NORTH PLAINFIELD TOWNSHIP.

Daniel C. Adams	Plainfield.
J. H. Carman	"
W. E. Mattison	"
J. H. Cooley	"

WARREN TOWNSHIP.

Peter J. Zeglio	Warrenville.

SUSSEX COUNTY.

ANDOVER TOWNSHIP.

Name.	P. O. Address.
Jeptha C. Clark	Andover.
Wm. R Smith	"

BYRAM TOWNSHIP.

C. R. Nelden	Stanhope.
C. H. Davison	"

FRANKFORD TOWNSHIP.

Joseph Hedges	Branchville.
J. Cole Price	"
Edward S. Dalrymple	"

GREEN TOWNSHIP.

Sidney B. Straley	Huntsville.

HAMPTON TOWNSHIP.

(No physicians reported.)

HARDYSTON TOWNSHIP

Name.	P. O. Address.
J. B. Pellet	Hamburg.
J. P. Couse	"

LAFAYETTE TOWNSHIP.

John C. Strader	Lafayette.
John L. Allen	"

MONTAGUE TOWNSHIP.

(No physicians reported.)

TOWN OF NEWTON.

Wm. Henry Lewis.	Newton.
Levi D. Miller	"
Ephraim Morrison	"
Bruno Hood	"
Shepard Voorhees	"

SUSSEX COUNTY—Continued.

SANDYSTON TOWNSHIP.

Name.	P. O. Address.
J. M. Miller	Laytons.
Martin Cole, Jr	Hainesville.

SPARTA TOWNSHIP.

T. H. Andress	Sparta.
L. C. Burd	Ogdensburg.

STILLWATER TOWNSHIP.

C. V. Moore	Stillwater.
J. H. McCloughn	Swartswood.
Jos. T. Hetzel	Stillwater.

VERNON TOWNSHIP.

Name.	P. O. Address.
Carlos Allen	Vernon P. O.

WALPACK TOWNSHIP.

(No physicians reported.)

WANTAGE TOWNSHIP.

Jos. Woolfe	Coleville.
E. C. Armstrong	Deckertown.
John Moore	“
H. D. Van Gaesbeck	“
Benj. Ferguson	Beemerville.
D. W. Cooper	Unionville.

UNION COUNTY.

CLARK TOWNSHIP.

(No physicians reported.)

CRANFORD TOWNSHIP.

Name.	P. O. Address.
Dr. McConnell	Cranford.
W. Cornell Allen	“

CITY OF ELIZABETH.

Name.	P. O. Address.
George W. Bailey	Elizabeth.
Pierce A. Banker	“
Rob't Brittain	“
Josephine I. Burceau	“
Louis R. Brown	“
Crane & Bridgeman	“
Anna J. Crouthers	“
Alfred Q. Donovan	“
Eleanor E. Galt	“
E. C. Jenigor	“
James S. Green	“
I. H. Grier	“
E. B. Grier	“
Thos. E. Hough	“
Herbert S. Jones	“
Johanna G. Leary	“
F. F. Livingood	“
W. A. M Mack	“
Thomas N. McLean	“
David M. Miller	“
Wm. A. Miller	“
J. B Morton	“
Victor Mravlag	“
E. R. O'Reilly	“
Alonzo Pettit	“
John H. Pickett	Elizabeth.
Davis Schleimer	“
Thomas Terrill	“
William F. Turner	“
N. L. Wilson	“
John Younglove	“

FANWOOD TOWNSHIP.

F. W. Wescott	Scotch Plains.
J. Ackerman Coles	“ “

LINDEN TOWNSHIP.

Henry C. Pierson	Roselle.

NEW PROVIDENCE TOWNSHIP.

A. M. Cory	New Providence.

CITY OF PLAINFIELD.

J. A. Allis	Plainfield.
J. F. Berg	“
W. C. Boone	“
Thos. S. Davis	“
J. T. Fritts	“
J. F. Griffen	“
E. W. Hedges	“
O. L Jenkins	“
Sarah D. Keeney	“
M. B. Long	“
H. H. Lowrie	“
A. Manning	“
W. H. Murray	“

UNION COUNTY—Continued,

Name.	P. O. Address.
Rebecca P. Page	Plainfield.
Comyges Paul	"
John B. Probasco	"
E. Rushmore	"
M. S. Simpson	"
T. H. Tomlinson	"
G. W. Endicott	"
C. M. Field	"

CITY OF RAHWAY.

D. W. C. Hough	Rahway.
Elihu B Silvers	"
W U Silvers	"
J. J Daly	"
H. Page Hough	"
W. E. Cladek	"
E. J. Westfall	"
F. W. Oliver	"
C. B. Holmes	"
John M. Randolph	"

SPRINGFIELD TOWNSHIP.

Name.	P. O. Address.
T. W. Harris	Springfield.
Thos. J. Cusack	"

SUMMIT TOWNSHIP.

W. H. Risk	Summit.
Wm. H. Lawrence	"
John Burling	"
A. S. Clutterbuck	"

UNION TOWNSHIP.

(No physicians reported.)

WESTFIELD TOWNSHIP.

Joseph B. Harrison	Westfield.
Sherman Cooper	"
Frederick A. Kinch, Jr.	"
Wm. Call	"
T. V. Smith	"
F. McNaughy	"

WARREN COUNTY.

ALLAMUCHY TOWNSHIP.

Name.	P. O. Address.
W. L. Lindabury	Allamuchy.

TOWN OF BELVIDERE.

E J. Bergen	Belvidere.
W H. McGee	"
Wm H. Burd	"
W C. Albertson	"
F. P. Lefferts	"

BLAIRSTOWN TOWNSHIP.

John C. Johnson	Blairstown.
Harry L. Carhart	"
Milton Armstrong	"
Wm. H. Vail	"

FRANKLIN TOWNSHIP.

Sam'l E. Crisman	Broadway.
F. S. Janson	Asbury.

FRELINGHUYSEN TOWNSHIP.

F. Rorback	Johnsonsburg.

GREENWICH TOWNSHIP.

T. F. Hulshizer	Stewartsville.
E. B Beatty	"
Wm. Shipman	Phillipsburg.

TOWN OF HACKETTSTOWN.

Name.	P. O. Address.
John S. Cook	Hackettstown.
A. C. Vansyckle	"
A. E. Martin	"
Gertrude Allen	"
Geo. L. Rundle	"

HARDWICK TOWNSHIP.

(No physicians reported.)

HARMONY TOWNSHIP.

James D. Dewitt	Harmony.
Garner H. Cline	"

HOPE TOWNSHIP.

John Miller	Hope.

INDEPENDENCE TOWNSHIP.

S W. Rowell	Vienna.
F. W. Haggerty	"

KNOWLTON TOWNSHIP.

(No physicians reported.)

LOPATCONG TOWNSHIP.

(No physicians reported)

MANSFIELD TOWNSHIP.

Harry S. Founk	Port Murray.

WARREN COUNTY—Continued.

OXFORD TOWNSHIP.

Name.	P. O. Address.
L. B. Hoagland	Oxford.
B. W. Hoagland	“
G. O. Tunison	“
Geo. S. Dearborn	“

PAHAQUARRY TOWNSHIP.

(No physicians reported.)

CITY OF PHILLIPSBURG.

Name.	P. O. Address.
J. M. Reese	Phillipsburg.
R. A. Stewart	“
L. C. Osmun	“
Isaac Barber	“
L. D. Bieber	“
A. C. Jacoby	Phillipsburg.
H. R. West	“
G. C. Young	“
J. H. Griffith	“

POHATCONG TOWNSHIP.

Name.	P. O. Address.
Warford L. Nixon	Riegelsville.
J. C. Albright	Springtown.

CITY OF WASHINGTON.

Name.	P. O. Address.
E. M. Cook	Washington.
Wm. Stites	“
J. V. Mattison	“
F. P. McKinstry	“
P. N. Jacobus	“

LIST OF THOSE WHO HAVE PASSED THE EXAMINATIONS OF THE BOARD OF MEDICAL EXAMINERS FROM OCTOBER, 1890, TO JULY, 1891.

Allen, Gertrude	Morristown.
Allen, Jacob M	Blairstown.
Allen, Winfred Cornell	Cranford.
Baird, David, Jr	Manalapan.
Baldwin, Winfred Eugene	Newark.
Beck, Alexander	Arlington.
Bennett, Francis Wayland	Atlantic City.
Blanchard, Oliver Rowland	Jersey City.
Brien, William Miller	Orange Valley.
Bunn, Frank Caulkins	Orange.
Chapman, Robert William, Jr	Newark.
Chew, Elisha Chew	Atlantic City.
Clark, Henry Herbert	Woodbury.
Connett, George Crammer	Morristown.
Cooper, Joseph Howard	Millstone.
Dare, Arthur	Vineland.
Doyle, Joseph Mark	Jersey City.
Drasel, Gustav William	Hoboken.
Felty, John Calvin	Trenton.
Fletcher, Zachary Peck	Jersey City.
Foster, William Story	Flatbrookville.
Friedman, David	Paterson.
Gallagher, William Charles	Jersey City.
Haines, Rowland Ivins	Camden.
Hallock, Henry M	Jersey City.

Hancock, Edward Clinton	Plainfield.
Hecht, Max	West Hoboken.
Hedges, Benjamin Van Doren	Plainfield.
Hetzel, Joseph Linn	Sussex county.
Hœning, Carl Leopold Gustav	Hoboken.
Hopper, Thomas Banta	Paterson.
Inglis, Roy	Jersey City.
Knecht, Cyrus	Matawan.
Kurtz, Clarence Suplee	Lambertville.
Lansing, Joseph Burnside Wands	Tenafly.
Lasker, Wilhelm	Fort Lee.
McLaughlin, George Eyerman	Jersey City.
McNair, Robert Hamilton	East Orange.
Mailly, Hamilton	Bridgeton.
Marsh, Caroline Hempstead	New Brunswick.
Meisgeier, Edward Benno	West Hoboken.
Moffat, Edgar Victor	Orange.
Montfort, Robert J	Elizabeth.
Mulvany, Edward	Jersey City.
Murphy, Francis Paul Keane	Jersey City.
Neal, Charles Bodine	Millville.
Neer, William	Paterson.
Neilson, William Howard	New Brunswick.
Nelden, Harry Holcombe	Stanhope.
O'Hanlon, Joseph Patrick	Trenton.
O'Leary, Dennis	Trenton.
Oberndorfer, Isidore Pierce	Long Branch.
Osmun, Louis Cook	Hackettstown.
Paris, Louis Jack	Orange.
Parmley, William Josiah	Morristown.
Parsons, John Cady	Jersey City.
Powell, William Macauley	Atlantic City.
Power, Henry	Montclair.
Price, John Henry	South Amboy.
Reed, Howard	Manasquan.
Reed, Louis Thompson	Somerville.
Reilly, Philip	Elizabeth.
Rundle, George Lester	Hackettstown.
Scofield, Alfred Hedges	Princeton.
Seidler, William Frederick, Jr	Newark.
Shelby, Edmund Pendleton, Jr	Jersey City.
Sherrill, George, Jr	Jersey City.
Shute, Albert Clement	Clarksboro.
Smith, Charles Bartles	Washington.
Snowball, James William	Flemington.
Sprague, Ezra Kimball	Jersey City.
Staehlin, Edward	Newark.
Stein, Frank Ott	Bayonne.
Tracy, Samuel Gately	Long Branch.

Trevisanello, Charles	Paterson.
Underwood, Benoni F. W	Keyport.
Van Riper, Washington Irving	Paterson.
Vineberg, Hiram Nahan	Long Branch.
Voorhees, Shepard	Newton.
Woolsey, William Watson	Trenton.
Worl, Edward Eli	Newark.
Wylie, Louise Lowrie	Cape May Point.

REPORT

OF THE

BUREAU OF VITAL STATISTICS

OF THE

STATE OF NEW JERSEY

FOR THE

Statistical Year from July 1st, 1890, to July 1st, 1891.

**WITH CLIMATOLOGY, LOCALITY, POPULATION,
VITAL RECORDS, ETC.**

By **EZRA M. HUNT, M.D., D.Sc.,**
Secretary and Medical Superintendent of Vital Statistics

REPORT ON VITAL STATISTICS.

BY EZRA M. HUNT, M.D., D.SC., MED. SUP'T. OF VITAL STATISTICS.

INTRODUCTION.

Vital Statistics increase each year in importance as their essential relation to the care of the public health and to other public interests become more and more manifest. The Superintendent of the Eleventh U. S. Census in his report says:

> "The great importance of complete and accurate records of vital statistics, including marriages, births, and deaths, is becoming more and more recognized in this country. Such records are the absolutely necessary foundation for well-directed attempts to improve the health and lengthen the life of the people; to increase the productive efficiency of the workers; to form a sound basis for the enormous money interest involved in the business of life insurance, and for other purposes vital to the health and well-being of the population. The great majority of the States have still no satisfactory system for registration of vital statistics, although most of them are slowly being improved in this respect."

At the recent International Congress at London, the section of Demography occupied a large place. Statistical methods seek to furnish a basis of actual fact in place of speculation. Even where tables are incomplete, the approximate methods of numerical calculation and analysis to no small degree allow for errors and correct them by definite and well-ascertained mathematical laws of probabilities. These at least are far more reliable than the vague generalizations of observation and inference. The records of this State have increased in number, in correctness and in value. We find that they were the only ones of all the States found available in our last census for study and comparison, together with those of some of the larger cities.

A comparison of this our thirteenth report of Vital Statistics with the one made for 1878, will show returns out of proportion to the increase of population, since then some localities made no returns at all, and many more only partial returns. We still fail to get a proper return of births especially in cities, although the deficiency can be calculated with some accuracy. Our chief embarrassment now is that by reason of inadequate appropriation, we are not able to make many of the various tables or combinations of statistics now considered valuable and informatory, and so in fact accumulate material which we cannot use in all the directions in which we can impart information. It fully pays, indeed, in the information which we cull from it as to the course, locality and cause of disease and the different age-periods of human life, but a thorough study and classification would give far more than this.

We are, however, of those who do not believe that it is the duty of the State to use all this material.

A proper method would be that the States should carefully and accurately accumulate the material on a uniform basis, and that then the General Government should look to the States as the source from which it can so copy and arrange as to be of the highest service. Thus the great value of large numbers would be secured, while at the same time there would not be that waste which must occur when each State does that, which is far better done in bulk by the General Government.

Surgeon Billings, in charge of the Vital Statistics of the Eleventh Census, has well illustrated this in the use he has made of the statistics of New Jersey, and of various cities.

If the U. S. Government would by proper appropriation extend the plan, it would be of the greatest service both to the Nation and to the States. At present the statistics of only three or four States are available, but the result would soon bring into line most of the States and cities and secure tables, charts and comments of the highest value in a statistical and practical point of view.

We shall continue to collect, classify and arrange our statistics in the best methods known to us for present and future use, and make the most we can of the means at our command.

Mr. Dallas Reeve, the Registrar of Vital Statistics, by his long and thorough acquaintance with the work and his systematic methods, has placed the Bureau in a most satisfactory condition so far as all the records since 1878 are concerned, and much aids the Medical Superintendent in his department of the work. Since the entire charge of all searches has been placed in this Bureau, and especially since the demand for pension certificates has increased, it adds greatly to the work of the office. Many of these searches have to be made previous to 1878 in old and illegible books, and so that part of the work is much complicated. All revenue from this source goes to the treasury of the State. A recent act, however, which requires that all searches for those seeking pensions be without charge, makes the income therefrom inconsiderable. Yet it is known that through the Adjutant-General's office and this office the greatest facilities are thus given to those who are in such circumstances as make it desirable to avoid application to pension agents.

In former reports and in Circular LXXII. of the last report, we have fully set forth the main facts as to the importance and availability of vital statistics, and so do not need to repeat them here.

As there are some terms as to vital statistics that are often met with and some confusion in their meaning even as referred to by some life insurance companies, we here give from the recent volume of Whitelegge on "Hygiene and Public Health," an abstract which presents them in a plain way, and is especially valuable, as showing the deductions to be made as to the expectation of life and length of life, as furnished by the most recent life-tables:

"*Statistical Evidence of Health of Communities.*—The usual criteria adopted are the death-rate, 'zymotic death-rate' and infant mortality, together with others of a different class, which are regarded as tests of the average longevity of a population, namely, 'expectation of life,' 'probable duration of life,' 'mean age at death.'

"The gross death-rate, or, still better, the corrected death-rate, affords a simple and, in the main, accurate measure of the comparative prevalence of disease. It is liable to become misleading if the figures are so small as to be exposed to violent fluctuations; thus the 'weekly death-rate' is only useful in very large communities. Other sources of error are (i) uncertainty as to population, and (ii) severe epidemics, which may have no known relation to impaired public health in general.

"The zymotic death-rate is a popular but very unsafe standard. A high death-rate from enteric fever, diphtheria or diarrhœa may in general fairly be taken to imply a defective sanitary state; but may also be due to temporary and accidental causes, such as climatic conditions or wholesale pollution of milk or water. Little is known of the determining causes of epidemics of small-pox, measles, whooping-cough and scarlet fever; but their predisposing causes are all widely different, and are for the most part not affected by what are known as 'sanitary conditions.' The death-rate due to such a heterogeneous group denotes simply the presence or absence of grave epidemics, and connotes nothing as to the health condition of the community in other respects.

"Infant mortality is influenced chiefly by the prevalence of epidemic diarrhœa in early autumn, by epidemics of whooping-cough or measles, and by the want of proper care and management on the part of mothers. It is sometimes high in towns which have a low general death-rate—Leicester, for example; and a high infant death-rate cannot, therefore, be regarded as necessarily indicating a high tendency to death among the rest of the population. It is highest in those towns in which the causes of epidemic diarrhœa are operative, and, as a rule, high in districts where female labor is largely employed in manufactures.

"At least equally significant with the zymotic death-rate and infant mortality is the *phthisis death-rate*, which, if excessive, indicates dampness of soil, unhealthy work-rooms or overcrowding of tenements. The death-rate from respiratory diseases (other than phthisis) is also important.

"'Mean age at death' is obtained by adding up the ages and dividing by the number of deaths. This is a very rough and imperfect measure of longevity, and is largely controlled by the birth-rate. A high birth-rate gives a large proportion of infants in the population, and hence a correspondingly large proportion of infant deaths, which must necessarily reduce the average age at death. The mean age at death is 42 years for males, and 45 years for females.

"'Probable duration of life' is the age at which exactly half of any given number of children born will have died. It can only be ascertained from a life-table, and is of no great value or convenience as a test of longevity. The latest English life-table gives the probable duration of life for males as 47, and for females as 52 years.

"'Expectation of life,' at any age, is the average number of years which a person at that age will live, as shown by a life-table. The expectation of life at age 0—*i. e.* at birth—is also known as the '*mean duration of life*.'* At other ages than the time of birth it is sometimes termed '*mean after-lifetime*,' and the present age *plus* the mean after-lifetime is the age to which a person may expect to survive.

"The expectation of life is the true measure of the vitality of a community. The expectation at birth is the most convenient for

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"* The 'mean duration of life' differs from the 'probable duration of life' just as the arithmetical mean of a list of numbers differs from the middle value of the series. The fact that one term has as many terms above as below it does not render it the mean of the series.

"The 'mean duration of life' must also be carefully distinguished from the 'mean age at death.' The latter expression is not employed in reference to a life-table population."

comparative purposes, but if necessary we can eliminate the influence of infant mortality by taking the expectation at later age.

"A life-table shows how many, out of a million persons supposed to be born simultaneously, will survive at the end of each year or each term of years. The data required are (1) a census population—that is, a population of which the distribution according to ages and sexes is known; (2) returns of deaths (grouped in the same age-periods as have been adopted for the census population) for one or more years among this same population. The simplest plan is to take only the deaths in the census year, when the population is known with precision; but as it is important to obtain large numbers, it is better to use the death returns of a series of three or more years, in which the census year is central. Thus the 1881 census population may fairly be assumed to be substantially the same as the average population in the years 1880, '81, '82. The most satisfactory method is to take the death returns for a whole inter-censal period, and the *mean* population. A separate table should be constructed for each sex."

We here add also a table as illustrative of mean annual death-rates from special diseases at different age-periods:

MEAN ANNUAL DEATH-RATES FROM CERTAIN CAUSES AT DIFFERENT AGE-PERIODS PER 1,000 LIVING AT EACH AGE-PERIOD. ENGLAND AND WALES, 1871–1880.

	0–5	5–10	10–15	15–20	20–25	25–35	35–45	45–55	55–65	65–75	75+
ALL CAUSES	62.12	6.44	3.70	5.38	7.04	8.93	12.62	17.72	31.49	64.85	161.59
Small-pox	.53	.28	.14	.20	.30	.24	.17	.11	.07	.05	.04
Measles	2.57	.21	.02	.01	.01	.01	.00	.00	.00	.00	.00
Scarlet Fever	3.49	1.52	.33	.10	.06	.05	.02	.01	.01	.00	.00
Diphtheria	.47	.29	.09	.03	.02	.02	.02	.01	.02	.02	.01
Whooping-cough	3.65	.14	.01	.00	.00	.00	.00	.00	.00	.00	.00
"Fever"	.65	.52	.44	.54	.51	.41	.38	.40	.46	.55	.50
Diarrhœa	5.78	.07	.02	.02	.04	.06	.10	.16	.41	1.19	3.51
Cancer	.01	.01	.01	.02	.03	.13	.53	1.26	2.21	3.12	3.38
Phthisis	.77	.36	.66	2.04	3.12	3.62	3.75	3.18	2.45	1.48	.49
Diseases of Nervous System	9.98	.57	.33	.36	.38	.60	1.20	2.25	4.91	11.43	21.28
Diseases of Circulatory System	.09	.14	.24	.30	.34	.62	1.31	2.27	4.81	9.48	12.09
Diseases of Respiratory System	12.20	.56	.20	.30	.45	.78	1.62	3.26	7.43	16.08	30.24
Diseases of Digestive System	1.28	.18	.15	.21	.26	.44	.90	1.67	3.01	4.84	5.69
Diseases of Urinary System	.15	.09	.07	.10	.15	.25	.43	.66	1.20	2.21	3.31
Violence	1.22	.39	.35	.44	.50	.56	.72	.93	1.19	1.46	2.56

NOMENCLATURE OF DISEASES, CONDENSED FORMS OF MORTUARY TABLES AND COMPARISON OF DEATH-RATES.

The Twelfth Report of this Board gives the nomenclature of disease in accord with the most recent and approved order thereof. It is well worthy of frequent reference by physicians, both as an aid to their own definiteness of diagnosis and for stating primary or secondary cause of death in burial certificates.

For brevity and convenience the following is the form and selection of the State Board in the abbreviated statement of yearly returns for handy reference.

SYNOPSIS OF VITAL AND MORTUARY STATISTICS.

BY THE MEDICAL SUPERINTENDENT OF VITAL STATISTICS.

The following outline presents the comparative number of marriages, births and deaths as follows:

Average for five years ending June 30th, 1883:

Marriages	8,539
Births	24,281
Deaths	21,981

Average for five years ending June 30th, 1888:

Marriages	*10,067
Births	26,050
Deaths	23,952

This average after June 30th, 1885, was on an increased population of 146,917.

The marriages occurring in Camden and other places, as a result of

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* Corrected from last report.

the Pennsylvania law, so far as known, are not counted in our reckoning, although necessarily recorded. The excess, as we have it, is as follows:

1886	2,527
1887	4,332
1888	4,557

The following is the record for the year, from July 1st, 1888, to June 30th, 1889:

Marriages (including 4,072 non-residents)	15,726
Marriages of non-residents	4,072
Births	29,099
Still-births	1,817
Deaths	26,543

The record from July 1st, 1889, to July 1st, 1890, is as follows:

Marriages (including 4,187 non-residents)	15,564
Marriages of non-residents	4,187
Births	30,103
Still-births	1,799
Deaths	28,530

The population of the State in 1880 was 1,131,116; in 1885, 1,278,133, and in 1890, 1,444,933.

The following is the record for the year, from July 1st, 1890, to July 1st, 1891:

Marriages (including 3,411 non-residents)	15,805
Marriages of non-residents	3,411
Births	28,882
Still-births	1,795
Deaths	28,840

COMMENTS AND COMPARISONS.

The following table shows the average number of deaths from each of the principal causes, from July 1st, 1878, to July 1st, 1888:

YEARLY AVERAGE OF DEATHS FROM PRINCIPAL DISEASES FOR TEN YEARS, BEGINNING JULY 1ST, 1878.

Remittent Fever	289
Typhoid Fever	579
Small-Pox	71
Scarlet Fever	610
Measles	135

Whooping-Cough	161
Diphtheria	1,280
Erysipelas	101
Diarrhœal Diseases	2,592
Consumption	3,182
Acute Lung	2,438
Brain and Nervous Diseases of Children	1,762
Diseases of Heart and Circulation	1,313
Renal and Urinary Diseases	753
Adult Brain and Spinal Diseases	1,405
Adult Digestive and Intestinal Diseases	1,093
Cancer	482
Acute Rheumatism	75
Puerperal	245

DEATHS FROM VARIOUS CAUSES FROM JULY 1ST, 1888, TO JULY 1ST, 1889.

Remittent Fever	203
Typhoid Fever	724
Small-Pox	3
Scarlet Fever	533
Measles	118
Whooping-Cough	278
Diphtheria	1,574
Erysipelas	114
Diarrhœal Diseases	3,377
Consumption	3,449
Acute Lung	2,862
Brain and Nervous Diseases of Children	1,923
Diseases of Heart and Circulation	1,786
Renal and Urinary Diseases	1,056
Adult Brain and Spinal Diseases	1,791
Adult Digestive and Intestinal Diseases	1,450
Cancer	579
Acute Rheumatism	117
Puerperal	254

DEATHS FROM VARIOUS CAUSES FROM JULY 1ST, 1889, TO JULY 1ST, 1890.

Remittent Fever	195
Enteric or Typhoid Fever	782
Small-Pox	0
Scarlet Fever	209
Measles	174
Whooping-Cough	371
Diphtheria and Croup	1,575
Erysipelas	81
Diarrhœal Diseases	3,527
Consumption	3,669

Acute Lung	3,804
Brain and Nervous Diseases of Children	2,032
Diseases of Heart and Circulation	1,945
Renal and Urinary Diseases	1,149
Adult Brain and Spinal Diseases	2,308
Adult Digestive and Intestinal Diseases	1,521
Cancer	640
Acute Rheumatism	106
Puerperal	250

DEATHS FROM VARIOUS CAUSES FROM JULY 1st, 1890, TO JULY 1st, 1891.

Remittent Fever	180
Enteric or Typhoid Fever	695
Small-Pox	0
Scarlet Fever	288
Measles	250
Whooping-Cough	299
Diphtheria and Croup	1,737
Erysipelas	85
Diarrhœal Diseases	3,191
Consumption	3,456
Acute Lung	4,161
Brain and Nervous Diseases of Children	2,029
Diseases of Heart and Circulation	1,960
Renal and Urinary Diseases	1,200
Adult Brain and Spinal Diseases	2,333
Adult Digestive and Intestinal Diseases	1,573
Cancer	642
Acute Rheumatism	76
Puerperal	296

The population of the State in 1880 was 1,131,116; in 1885, 1,278,133, and in 1890, 1,444,933.

(For comparison, reckon the first quinquennial on the population of 1880, the second on that of 1885, and the last three years on the average of estimated population since.)

COMPARISON OF DEATH-RATES.

A comparison of death-rates is one of the legitimate uses to be made of vital statistics if only all the conditions which make such comparisons informatory as to the relations of health, disease and death are fulfilled. Even if not fulfilled, approximations are of value if only they are recognized at their true worth. We even feel apologetic toward indefensible comparisons and imperfect deductions when they grope toward the true light. In the Census of 1880, Dr. *Billings*, I think, had some maps drawn showing, as a result of the returns, the distribution of malaria in the United States. He expended most of his remarks in showing how unreliable the maps were, yet he pointed to them as showing lines of direction for legitimate work. I myself with regret see all sorts of deductions from vital statistics that have no basis in the figures, in reason or in fact. Some Western man, from the statistics of Connecticut, New Jersey, &c., has been drawing a kidney belt, and showing that here is the storm-center of Bright's disease.

Two years since, in one of our reports, I had occasion to speak as follows:

"Returns of death are valuable *en masse* or in their entirety, first as indicating the general mortality of the population, and the diseases by which it is limited or destroyed. We desire to emphasize the words *en masse*, or entirety. Nothing can be more subversive of the real use of statistics than a wholesale statement of the number of deaths per thousand and an inference of sanitary conditions therefrom, unless the population on which they are based is 100,000 or over, and unless right alongside there is a statement as to the diseases which have occasioned the deaths, the age of the material exposed, and the ages of those dying. The death-rate in gross is merely the statement of a leading fact, which is to form a nucleus for the arrangement and comparison of other statements, both as to mortality and morbility. * * * At least, let no physician or citizen get it into his head that the death statistics are only designed to show the sanitary condition of the locality. In a sphere, and properly used, they show him much about this, but many things more important."

A year since, in addressing a letter to a gentleman as to complaints in respect to the *pro rata* of the death-rate of his section, I had occasion to speak thus:

"When a citizen sees a statement that the death-rate in his city was only twenty per 1,000 the past year, let him know that such bare fact does not indicate very much as to healthfulness. The statistician does use it as one of many facts for comparison. For instance, if, as is the case, he finds the death-rate of London, with its five and a half millions of people, only 17.5 per 1,000, he does bear in mind the contrast. But with this as only a starting-point, he goes on to compare ages of death, so as to know how the significance of number is modified by the significance of age. He then proceeds to find how both of these are modified by the significance of diseases, as deaths by some diseases mean far more, as to local sanitary conditions, than is meant by the same number of deaths from some other diseases. But the statistician goes further. He then asks in what part of the city—in what kind of houses—they died, and what were their advantages or disadvantages as to food, water and care. He also, as far as possible, inquires into heredity, vitality, into the rate of sickness as compared with the death-rate, and into other indications which show how the general race-vitality at the general working-age, and how the endurance of the population are being affected; for these are not always in exact proportion to the number of deaths.

"The evils of statistics are the drawing of hasty and unauthorized conclusions from them. Their value is that in their study, comparison and assortment, they furnish to us some of the valuable materials which, joined with other information, enable us to practically deal with the limitation and prevention of disease.

"Thus, by restraining the people, and sometimes ourselves, from hasty generalizations, and by using the record as *parts* of evidence and only for purposes intimated, we shall find them highly valuable in aiding in the prevention and the cure of disease, and in guarding the life, health and welfare of population."

We have now had twelve years of vital statistics in New Jersey, which, with some allowance for the time taken to place the system in working order, presents a fair outline of the results of disease and accident in the State.

I desire just here, not to indicate all that can be done with such statistics elsewhere or in the future, but what can be done in our present studies of say 12,000,000 people through a period of twelve years, from whose ranks over 275,000 have departed.

The first indication as to comparative healthfulness to be derived from a study of all the facts, will be sought somewhat thus:

First. Compare the entire city population in cities over 5,000, with the entire rural populations. They are nearly enough balanced in New Jersey to admit of valuable comparisons in all such particulars as to numbers dying, at what ages, and of what diseases. A sub-comparison or subdivision might be made by dividing cities into two divisions, viz., those large and manufacturing and with much variety of population, and those that are more rural or centers of farming districts, as Bordentown, Burlington, Woodbury, Newton, Morristown, Long Branch, in compare with Jersey City, Newark, Trenton and Camden.

Second. Study especially, both as to places and causes of deaths, those who have died under five years of age, the first month not being included.

Third. Study the diseases with especial reference to the diarrhoeal diseases of children, diphtheria and enteric fever.

Tuberculosis in all its forms is an important separate study, as to its death-rate. So, also, small-pox, scarlet fever, measles, whooping-cough, influenza, mumps, &c.

While the aggregated yearly death-rate for ten years has important significance, it is only when interpreted by the light of these other data that it is especially informatory.

More important still is it for our cities to have records of their own, which will give by houses and blocks and causes the mortality, and, as far as possible, the morbility.

Better still if graphics or dotted maps, with varied colors for diseases, aid and illustrate the record.

These are the kind of studies that, in some of our American cities, like New York, and many foreign cities, like London, Glasgow, Paris, &c., have most fully indicated the facts and the preventive or modifying methods to be used in order to diminish the frequency of disease and the aggregate of death.

The following summary from an article in the "Edinburgh Review" (1891), presents interesting facts bearing on death-rates:

"If all men lived their full span of eighty years the death-rate would be 12.5 per thousand. In Surrey, outside London, the actual death-rate was brought down to 14.3. The death-rate in 1838, in England, was 22.4, but it has never fallen below 21. In the ten years from 1871 to 1880, the children born in any one of these years had 1,800,000 years more of expectation of life than they would have had if they had been born between 1838 and 1854. Notwithstanding all our sanitary progress, the chance of a man reaching threescore years and ten is smaller than it was sixty years ago. In London, in the second half of the seventeenth century, the death-rate was 80 per thousand; in the eighteenth it had fallen to 50 per thousand; in the first half of the nineteenth to 25, and it is now down to 17½. Rothbury has the lowest death-rate in the kingdom, viz., 11.33. The death-rate goes up the more crowded the population is to the square mile. In 129 districts, with less than 200 per square mile, the death-rate is 18½, while in those which have a density of 6,000 to the square mile, the death-rate is 30¼. In London the death-rate from zymotic diseases has fallen from 5.2 in 1840 to 1850, to 2.24 in 1889. The death-rate from consumption has fallen from 2.68 in 1851 to 1860 to 1.55 in 1888. Deaths from diseases of the nervous system in London are fewer than those in Wiltshire. In 1888 the figures were: London, 2.19 per thousand; Wiltshire, 2.67."

THE CENSUS AND COMPARATIVE FACTS AS RELATED TO VITAL STATISTICS.

BY A. CLARK HUNT, M.D.

The object of a census is not merely the numbering of a people so as to secure facts as to the increase or decrease, but also to ascertain the most important conditions of the population and the influences affecting their welfare. There is a recognition of the fact that population is a material resource to a degree that no other product, animal, vegetable or mineral, is, and that the development of the people is the highest duty of state polity and government. In order to study population there are series of facts that must be ascertained. Of these, few are of more importance than those associated under the name of Vital Statistics. Marriages, births and deaths not only essentially concern the increase of the people but influences that are at work to modify or diminish these or that embarrass life in its relation to any of these, can never be overlooked by the political economist. Hence it is that in all enlightened nations, in addition to various inquiries as to numbers, occupations, distribution of population, its propensities and embarrassments, omission is no longer made of such facts as will enable us to examine into every department of what is now called demography, or a study of population.

For our purpose of comparison and record in this State it is first necessary that we ascertain the increase or decrease of population at various periods in our minor civil divisions and then consider these in the aggregate.

We therefore first give the population of New Jersey for 1890 and 1880 as presented in the enumeration of the recent census.

POPULATION BY MINOR CIVIL DIVISIONS.

MINOR CIVIL DIVISIONS.	1890.	1880.
ATLANTIC COUNTY.		
Atlantic City	13,055	5,477
Buena Vista township	1,299	885
Egg Harbor City	1,439	1,232
Egg Harbor township, including Linwood borough and Absecon town (*a*)	4,256	4,075
Linwood borough	*536*	....
Absecon town	*501*	*507*
Galloway township	2,208	2,337
Hamilton township, including borough of Wilmer	1,512	1,464
Hammonton township, co-extensive with Hammonton town	3,833	1,776
Mullica township	697	717
Weymouth township	588	741
Total	28,836	18,704
BERGEN COUNTY.		
Boiling Spring township (*b*)	1,488	....
Englewood township	4,785	4,076
Franklin township	2,807	2,306
Harrington township	2,769	2,570
Hohokus township	2,878	2,920
Lodi township	5,131	4,071
Midland township	1,829	1,501
New Barbadoes township, co-extensive with Hackensack town	6,004	4,248
Orvil township (*b*)	1,690	....
Palisade township	2,590	2,302
Ridgefield township	5,477	3,952
Ridgewood township	1,841	1,478
Rutherford borough	2,293	2,299
Saddle River township	2,197	1,855
Union township	1,560	(c) 865
Washington township	2,942	2,858
Total	47,226	36,786
BURLINGTON COUNTY.		
Bass River township	858	1,006
Beverly city	1,957	1,759
Beverly township	1,451	(*d*) 1,369
Bordentown township, including Bordentown city	5,090	5,334
Bordentown city	4,232	4,255
Burlington township, including Burlington city	8,222	7,237
Burlington city and Fieldsboro	7,264	6,090
Chester township	3,768	2,856
Chesterfield township	1,258	1,525
Cinnaminson township	3,966	2,184
Delran township	2,267	1,760
Eastampton township	654	566
Evesham township	1,501	1,602
Florence township	1,922	1,528
Little Egg Harbor township (*e*)	1,771	1,881
Lumberton township	1,799	1,689
Mansfield township	1,671	1,648
Medford township	1,864	1,980
Mount Laurel township	1,699	1,789
New Hanover township	1,962	2,873
Northampton township	5,376	4,630
Pemberton township, including Pemberton borough	2,689	2,895
Pemberton borough	824	799
Randolph township	302	428

(*a*) Absecon town was set off from Egg Harbor township and should not be included with it.

(*b*) Organized since 1880.

(*c*) Exclusive of Rutherford borough.

(*d*) Exclusive of Beverly city.

(*e*) Since annexed to Ocean county.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
BURLINGTON COUNTY—Continued.			
Shamong township		958	1,097
Southampton township		1,849	2,269
Springfield township		1,670	1,886
Washington township		310	889
Westampton township		688	715
Willingboro township		789	743
Woodland township		327	825
Total		58,528	55,402
CAMDEN COUNTY.			
Camden city		58,313	41,659
Ward 1	7,650		
Ward 2	9,536		
Ward 3	4,533		
Ward 4	5,299		
Ward 5	7,325		
Ward 6	6,956		
Ward 7	6,149		
Ward 8	5,996		
Ward 9	4,869		
Center township		1,834	1,533
Delaware township		1,457	1,481
Gloucester city		6,564	5,347
Ward 1	2,845		
Ward 2	3,719		
Gloucester township		3,091	2,527
Haddon township, including Haddonfield and Collingswood boroughs		3,929	2,551
Collingswood borough		*539*	
Haddonfield borough		*2,502*	*1,480*
Merchantville borough		1,225	489
Stockton township		6,445	(*e*) 3,093
Waterford township		2,421	2,149
Winslow township		2,408	2,153
Total		87,687	62,942
CAPE MAY COUNTY.			
Anglesea borough (*f*)		161	
Cape May City		2,136	1,699
Cape May Point borough		167	
Dennis township		1,707	(*g*) 1,812
Holly Beach City borough (*h*)		217	
Lower township		1,156	(*i*) 1,977
Middle township		2,368	(*j*) 2,575
Ocean City borough (*k*)		452	
Sea Isle City borough (*l*)		766	
Upper township		1,881	(*m*) 1,702
West Cape May borough		757	
Total		11,268	9,765

(*e*) Exclusive of Merchantville borough.

(*f*) Organized since 1880 from Middle township.

(*g*) Includes population of Sea Isle City borough.

(*h*) Organized since 1880 from Lower township.

(*i*) Includes population of West Cape May, Cape May Point and Holly Beach boroughs.

(*j*) Includes population of Anglesea borough.

(*k*) Organized since 1880 from Upper township.

(*l*) Organized since 1880 from Dennis township.

(*m*) Includes population of Ocean City borough.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
CUMBERLAND COUNTY.			
Bridgeton city		11,424	8,722
Ward 1	3,158		
Ward 2	3,023		
Ward 3	2,865		
Ward 4	2,378		
Commercial township		2,344	2,265
Deerfield township		2,614	1,643
Downe township		1,793	1,687
Fairfield township		1,683	(n) 3,215
Greenwich township		1,178	1,245
Hopewell township		1,743	1,764
Landis township		3,855	(o) 3,486
Lawrence township (p)		1,729	....
Maurice River township		2,279	2,374
Millville city		10,002	7,660
Ward 1	3,352		
Ward 2	1,705		
Ward 3	3,057		
Ward 4	1,888		
Stoe Creek township		972	1,107
Vineland borough		3,822	2,519
Total		45,438	37,687
ESSEX COUNTY.			
Belleville township		3,487	3,004
Bloomfield township		7,708	5,748
Caldwell township		3,638	3,167
Clinton township		8,684	2,742
East Orange township		13,282	8,349
Franklin township		2,007	1,617
Livingston township		1,197	1,401
Millburn township		2,437	1,743
Montclair township		8,656	5,147
Newark city		181,830	136,508
Ward 1	7,595		
Ward 2	7,151		
Ward 3	6,404		
Ward 4	5,946		
Ward 5	5,408		
Ward 6	25,830		
Ward 7	9,283		
Ward 8	19,575		
Ward 9	7,084		
Ward 10	13,897		
Ward 11	11,784		
Ward 12	19,616		
Ward 13	27,600		
Ward 14	5,700		
Ward 15	8,957		
Orange city		13,844	13,207
Ward 1	4,931		
Ward 2	5,431		
Ward 3	3,482		
South Orange township, including South Orange borough		4,970	2,911
South Orange borough		*3,106*	*2,173*
West Orange township		4,358	3,385
Total		256,098	189,929

(*n*) Includes Lawrence township; taken from Fairfield in 1885.

(*o*) Exclusive of Vineland borough.

(*p*) From Fairfield in 1885.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
GLOUCESTER COUNTY.			
Clayton township, including Clayton borough		2,299	1,961
Clayton borough		*1,807*	*1,433*
Deptford township		2,064	(*q*) 1,520
East Greenwich township (*r*)		1,259	....
Franklin township		2,021	2,480
Glassboro township (*s*)		2,642	2,068
Greenwich township		1,900	(*t*) 2,598
Harrison township		1,545	(*u*) 2,841
Logan township		1,523	1,765
Mantua township		1,791	1,718
Monroe township		1,945	1,858
South Harrison township (*v*)		971	....
Washington township		1,155	1,366
West Deptford township		1,588	1,399
Woodbury city		3,911	2,298
Ward 1	1,014		
Ward 2	1,654		
Ward 3	1,243		
Woolwich township, co-extensive with Swedesboro town		2,035	1,974
Total		28,649	25,886
HUDSON COUNTY.			
Bayonne city		19,033	9,372
Ward 1	2,085		
Ward 2	3,868		
Ward 3	3,178		
Ward 4	4,402		
Ward 5	5,505		
Guttenberg town		1,947	1,206
Harrison city		8,338	6,898
Ward 1	2,143		
Ward 2	1,203		
Ward 3	1,947		
Ward 4	3,045		
Hoboken city		43,648	30,999
Ward 1	10,063		
Ward 2	5,765		
Ward 3	14,859		
Ward 4	12,961		
Jersey City		163,003	120,722
Aldermanic district 1	17,837		
Aldermanic district 2	30,216		
Aldermanic district 3	24,312		
Aldermanic district 4	36,776		
Aldermanic district 5	20,294		
Aldermanic district 6	33,568		
Kearny township		7,064	777
North Bergen township		5,715	4,268
Union town		10,643	5,849
Union township		2,127	1,310
Weehawken township		1,943	1,102
West Hoboken township		11,665	5,441
Total		275,126	187,944

(*q*) Exclusive of Woodbury city.

(*r*) Organized since 1880; taken from Greenwich township.

(*s*) In 1891 Elk township was formed from parts of Clayton, Glassboro and South Harrison townships.

(*t*) Includes population of East Greenwich township.

(*u*) Includes population of South Harrison township.

(*v*) Organized since 1880; taken from Harrison township.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
HUNTERDON COUNTY.			
Alexandria township		1,250	1,324
Bethlehem township		2,306	2,330
Clinton township, including Clinton town		2,838	2,975
Clinton town		*1,975*	*842*
Delaware township		3,087	3,092
East Amwell township		1,375	1,696
Franklin township		1,287	1,333
Frenchtown borough		1,023	1,039
High Bridge township		1,935	2,299
Holland township		1,704	1,886
Kingwood township		1,424	1,694
Lambertville city		4,142	4,183
Ward 1	1,274		
Ward 2	1,163		
Ward 3	1,705		
Lebanon township		2,337	2,699
Raritan township		3,798	4,185
Readington township		2,813	3,108
Tewksbury township		2,084	2,103
Union township		1,184	1,167
West Amwell township		866	1,089
Total		35,355	38,570
MERCER COUNTY.			
Chambersburg borough		(w)	5,437
East Windsor township, including Hightstown borough		2,756	2,271
Hightstown borough		*1,875*	*1,355*
Ewing township		3,129	2,412
Hamilton township		4,163	3,370
Hopewell township		4,338	4,462
Lawrence township		1,448	(x) 3,174
Princeton township, including Princeton borough		4,231	4,348
Princeton borough		*3,422*	*3,209*
Trenton city		57,458	29,910
Ward 1	5,076		
Ward 2	3,068		
Ward 3	7,331		
Ward 4	5,062		
Ward 5	5,585		
Ward 6	2,791		
Ward 7	9,383		
Ward 8	3,802		
Ward 9	6,128		
Ward 10	3,949		
Ward 11	5,318		
Washington township		1,126	1,281
West Windsor township		1,329	1,396
Total		79,978	58,061
MIDDLESEX COUNTY.			
Cranbury township		1,422	1,599
East Brunswick township		4,488	3,273
Madison township		1,520	1,662
Monroe township		3,040	3,017
New Brunswick city		18,608	17,166
Ward 1	2,578		
Ward 2	3,556		
Ward 3	1,731		
Ward 4	912		
Ward 5	5,122		
Ward 6	4,709		

(w) Annexed to Trenton since 1880 as Millham.

(x) Includes that part annexed to Trenton since 1880.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
MIDDLESEX COUNTY—Continued.			
North Brunswick township		1,238	1,251
Perth Amboy township, co-extensive with Perth Amboy city		9,512	4,808
Perth Amboy city by wards—			
Ward 1	2,533		
Ward 2	3,321		
Ward 3	3,658		
Piscataway township, including Dunellen borough		3,286	3,242
Dunellen borough		*1,060*	*817*
Raritan township		3,788	3,789
Sayreville township		3,509	1,930
South Amboy township, co-extensive with South Amboy borough		4,330	3,648
South Brunswick township		2,408	2,803
Woodbridge township		4,665	4,099
Total		61,754	52,286
MONMOUTH COUNTY.			
Atlantic township		1,506	1,748
Eatontown township		2,958	2,642
Freehold township, including Freehold town		5,097	4,302
Freehold town		*2,932*	*2,432*
Holmdel township		1,479	1,575
Howell township		3,018	3,874
Manalapan township		2,002	2,175
Marlboro township		1,918	2,198
Matawan township		3,183	2,699
Middletown township, including Atlantic Highlands town		6,595	5,059
Atlantic Highlands town		*945*	....
Millstone township		1,782	2,080
Neptune township, including Ocean Grove town and Asbury Park borough (y)		8,333	4,187
Ocean Grove town		*2,754*	*620*
Ocean township, including Long Branch town		10,209	6,027
Long Branch town		*7,231*	*3,833*
Raritan township, including Keyport town		4,779	3,891
Keyport town		*3,411*	....
Shrewsbury township, including Red Bank town		8,367	6,526
Red Bank town		*4,145*	*2,684*
Upper Freehold township		2,861	3,236
Wall township, including Manasquan town		5,062	3,829
Manasquan town		*1,506*	....
Total		69,128	55,538
MORRIS COUNTY.			
Boonton township, including part of Boonton city		3,307	2,682
Boonton city (part of)		*2,981*	....
Chatham township		4,681	4,276
Chester township		1,625	2,887
Hanover township, including part of Boonton city (y)		4,481	4,138
Jefferson township		1,611	1,792
Mendham township		1,266	1,526
Morris township, including Morristown city		10,156	6,837
Morristown city		*8,156*	*5,418*
Mount Olive township		1,848	1,982
Montville township		1,333	1,270
Passaic township		1,821	1,896
Pequannock township		2,862	2,289
Randolph township		7,972	7,700
Rockaway township		6,033	7,366
Roxbury township		2,739	2,189
Washington township		2,367	2,681
Total		54,101	50,861

(y) Not separately returned.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
OCEAN COUNTY.			
Berkeley township		786	683
Brick township		4,066	2,999
Dover township		2,880	2,480
Eagleswood township		791	592
Jackson township		1,717	1,808
Lacey township		711	814
Manchester township		1,057	1,057
Ocean township		482	484
Plumsted township		1,827	1,561
Stafford township		1,095	1,008
Union township		1,068	1,024
Total		15,974	14,455
PASSAIC COUNTY.			
Acquackanonk township		2,562	1,781
Little Falls township		1,890	1,404
Manchester township		2,576	1,613
Passaic city		13,028	6,532
Ward 1	5,075		
Ward 2	2,844		
Ward 3	1,677		
Ward 4	3,432		
Paterson city		78,347	51,031
Ward 1	8,824		
Ward 2	10,895		
Ward 3	15,180		
Ward 4	8,890		
Ward 5	10,835		
Ward 6	4,024		
Ward 7	5,956		
Ward 8	14,743		
Pompton township		2,158	2,261
Wayne township		2,094	1,757
West Milford township		2,486	2,891
Total		105,046	68,860
SALEM COUNTY.			
Elsinboro township		524	570
Lower Alloways Creek township		1,808	1,373
Lower Penns Neck township		1,289	1,384
Mannington township		1,870	2,290
Oldmans township (z)		1,432	....
Pilesgrove township, including Woodstown borough		3,312	3,497
Woodstown borough		556	490
Pittsgrove township		2,756	1,778
Quinton township		1,307	(a) 1,390
Salem city		5,516	5,056
East ward	2,891		
West ward	2,625		
Upper Alloways Creek township		1,675	1,917
Upper Penns Neck township		2,289	(b) 3,361
Upper Pittsgrove township		1,928	2,073
Total		25,151	24,579

(z) Organized since 1880 from Upper Penns Neck township.

(a) Exclusive of Salem city.

(b) Includes population of Oldmans township; taken from Upper Penns Neck since 1880.

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
SOMERSET COUNTY.			
Bedminster township		1,749	1,812
Bernards township		2,558	2,622
Branchburg township		1,152	1,816
Bridgewater township, including Somerville, Bound Brook and Raritan boroughs		9,323	7,997
Somerville borough		*3,861*	*3,105*
Bound Brook borough		*1,462*	*934*
Raritan borough		*2,556*	*2,046*
Franklin township, including Bloomington borough		3,754	3,818
Bloomington borough		*801*	*671*
Hillsborough township		2,825	3,248
Montgomery township		1,655	1,928
North Plainfield township		4,250	3,217
Warren township		1,045	1,204
Total		28,311	27,162
SUSSEX COUNTY.			
Andover township		1,126	1,150
Byram township		1,380	1,406
Frankford township		1,459	1,682
Green township		686	727
Hampton township		866	895
Hardyston township		2,542	2,645
Lafayette township		742	781
Montague township		797	1,022
Newton township, co-extensive with Newton town		3,008	2,518
Sandyston township		1,084	1,195
Sparta township		1,724	2,274
Stillwater township		1,296	1,502
Vernon township		1,756	1,811
Walpack township		486	575
Wantage township		3,412	3,361
Total		22,259	23,539
UNION COUNTY.			
Clark township		367	353
Cranford township		1,717	1,184
Elizabeth city		37,764	28,229
Ward 1	8,874		
Ward 2	7,610		
Ward 3	5,886		
Ward 4	2,218		
Ward 5	5,990		
Ward 6	2,597		
Ward 7	2,004		
Ward 8	2,640		
Fanwood township		1,305	1,167
Linden township		2,057	1,889
New Providence township		839	781
Plainfield city		11,267	8,125
Ward 1	2,221		
Ward 2	2,897		
Ward 3	2,203		
Ward 4	3,946		
Rahway city		7,105	6,455
Ward 1	1,862		
Ward 2	1,687		
Ward 3	2,746		
Ward 4	1,810		
Springfield township, co-extensive with Springfield town		959	844
Summit township		3,502	1,910
Union township		2,846	2,418
Westfield township		2,739	2,216
Total		72,467	55,571

POPULATION BY MINOR CIVIL DIVISIONS—Continued.

MINOR CIVIL DIVISIONS.		1890.	1880.
WARREN COUNTY.			
Allamuchy township		759	648
Belvidere town		1,768	1,778
Blairstown township		1,662	1,458
Franklin township		1,288	1,529
Frelinghuysen township		879	1.042
Greenwich township		825	(*c*) 2,554
Hackettstown town		2,417	2,502
Hardwick township		503	583
Harmony township		1,152	1,350
Hope township		1,382	1,569
Independence township		904	1,018
Knowlton township		1,411	1,476
Lopatcong township		1,788	1,591
Mansfield township		1,362	1,709
Oxford township		4,002	(*d*) 4,594
Pahaquarry township		291	418
Phillipsburg city		8,644	7,131
Ward 1	2,033		
Ward 2	2,207		
Ward 3	2,799		
Ward 4	1,605		
Pohatcong township (*e*)		1,488	....
Washington township, including Washington borough		4,188	3,594
Washington borough		*2,834*	*2,142*
Total		36,553	36,589

(*c*) Includes Pohatcong township.

(*d*) Exclusive of Belvidere town.

(*e*) Organized in 1881 from part of Greenwich township.

We next give the total population of the State according to the census of 1880, 1885, 1890 and other facts as to how this is made up—male, female, native, &c.:

Entire population of the State, 1880	1,131,116
Entire population of the State, 1885	1,278,133
Entire population of the State, 1890	1,444,933

The last census (1890), as to sex, color, &c., is as follows:

Males	720,819
Females	724,114
Native	1,115,958
Foreign	328,975
White	1,396,581
Colored	48,352
Native white parents	696,718
Foreign white parents	371,878

We next present a summary, by counties, giving the population by the census of 1880, by the State census of 1885 and by the census of

1890. As our most important comparisons are those of death-rates, we also present the death-rates for counties in each of the years in which these different enumerations were made:

SUMMARY BY COUNTIES.

COUNTIES.	Population, 1880.	Death-rate per 1,000.	Population, 1885.	Death-rate per 1,000.	Population, 1890.	Death-rate per 1,000.
Atlantic	18,709	16.78	22,856	19.46	28,836	17.67
Bergen	36,786	18.86	39,880	15.10	47,226	15.25
Burlington	55,402	14.42	57,558	15.84	58,528	14.61
Camden	62,942	18.81	76,685	17.87	87,687	21.60
Cape May	9,765	12.90	10,744	14.99	11,268	15.47
Cumberland	37,687	16.20	41,982	16.82	45,438	16.06
Essex	189,929	17.35	218,764	21.81	256,098	23.89
Gloucester	25,886	14.48	27,608	16.70	28,649	16,20
Hudson	187,944	21.41	240,842	22.51	275,126	25.72
Hunterdon	38,570	12.81	37,420	12.45	35,355	14.78
Mercer	58,061	18.05	66,785	17.41	79,978	18.06
Middlesex	52,286	14.86	56,180	16.84	61,754	15.68
Monmouth	55,538	18.54	62,324	17.09	69,128	15.86
Morris	50,861	18.26	50,775	15.94	54,101	15.83
Ocean	14,455	11.20	15,586	17.19	15,974	14.97
Passaic	68,860	21.86	83,874	19 17	105.046	20.04
Salem	24,579	14.72	25,878	18.75	25,151	15.27
Somerset	27,162	12.62	27,425	15.24	28,311	15 58
Sussex	23,539	12.06	22,401	14.46	22,259	10.48
Union	55,571	15.11	61,389	18.84	72,467	17.56
Warren	36,589	14.54	37,787	14.31	36,553	14.40

In the same manner we present the same series of facts as to all cities of over 5,000 inhabitants:

CITIES OF OVER 5,000 INHABITANTS.

CITIES AND TOWNS.	COUNTIES.	Population, 1880.	Death-rate per 1,000.	Population, 1885.	Death-rate per 1,000.	Population, 1890.	Death-rate per 1,000.
Newark City	Essex	136.508	18.71	152,988	24.88	181,830	27.26
Jersey City	Hudson	120,722	20.98	153,513	22.42	163,003	25.96
Paterson City	Passaic	51,031	23.07	63,273	20.29	78,347	21.87
Camden City	Camden	41,659	19,27	52,884	18.80	58,313	23.15
Trenton City	Mercer	29,910	20.66	34,386	17.48	57,458	17.35
Hoboken City	Hudson	30,999	23.71	37,721	22.85	43,648	25.62
Elizabeth City	Union	28,229	15.58	8,398	21.70	37,764	19.80
Bayonne City	Hudson	9,372	15.04	13,080	18 58	19,033	20.87
Orange City	Essex	13,207	16.85	15,231	19.70	18,844	24.50
New Brunswick City	Middlesex	17,166	15.66	18 258	18.40	18,603	17.71
Atlantic City	Atlantic	5.477	....	7,948	23.54	13,055	20.01
Passaic City	Passaic	6,532	21.78	8,826	16.69	13,028	16.81
Bridgeton City	Cumberland	8,722	17.75	·10,065	17.78	11,424	17.70
Plainfield City	Union	8,125	12.06	8,918	15.82	11,267	16 89
Union Town	Hudson	5,849	20.04	8,898	25.84	10,643	22.42
Millville City	Cumberland	7,660	22.71	8,824	16.89	10,002	19.48
Perth Amboy City	Middlesex	4,808	....	6,811	....	9,512	17.41
Phillipsburg City	Warren	7,181	17.54	8,058	18.87	8,644	14.96
Harrison City	Hudson	6,898	23.41	6,806	23.36	8,338	27.67
Morristown City	Morris	5,418	18.71	....	14.61	8,156	19.91
Burlington City	Burlington	6,090	15.61	6,653	24.45	7,264	18.30
Long Branch Town	Monmouth	3,833	....	5,140	....	7,231	14.66
Rahway City	Union	6,455	17.97	6,861	15.60	7,105	19.82
Gloucester City	Camden	5,847	15.70	5,966	15.42	6,564	18.89
Hackensack Town	Bergen	4,248	....	....	....	6,004	....
Salem City	Salem	5,056	15.02	5,516	19.22	5,516	17.60

We also give below the number of families and of dwellings in cities of over 4,000 inhabitants, by the census of 1890.

CITIES AND TOWNS.	Number of families.	Number of dwellings.	CITIES AND TOWNS.	Number of families.	Number of dwellings.
Newark	38,906	28,296	Millville	2,154	2,117
Jersey City	34,484	18,562	Perth Amboy	1,860	1,463
Paterson	16,815	9,870	Phillipsburg	1,847	1,826
Camden	12,667	12,862	Harrison	1,794	1,168
Trenton	11,901	11,428	Morristown	1,457	1,457
Hoboken	9,418	3,411	Burlington	1,627	1,618
Elizabeth	7,683	5,820	Long Branch	1,607	1,506
Bayonne	3,487	2,697	Rahway	1,627	1,427
Orange	3,708	2,938	Gloucester	1,322	1,323
New Brunswick	4,026	3,076	Hackensack	1,318	1,149
Atlantic City	2,851	2,801	Salem	1,355	1,356
Passaic	2,481	1,723	South Amboy	913	909
Bridgeton	2,649	2,597	Bordentown	955	952
Plainfield	2,172	1,968	Red Bank	925	852
Union	2,400	1,435	Lambertville	1,001	993

We give as a collateral table of interest, a list of cities, towns, villages, &c., of the State, so far as these can be given, with their populations. Those of less than 1,000 inhabitants are not included. The population is here given by the census of 1890.

CITIES, TOWNS, ETC.

ATLANTIC COUNTY.

Atlantic City, city	13,055
Egg Harbor City, in Galloway township	1,439
Hammonton, town	3,833

BERGEN COUNTY.

Hackensack, in New Barbadoes township	6,004

BURLINGTON COUNTY.

Beverly, city, in Beverly township	1,957
Bordentown, city, in Bordentown township	4,232
Burlington, city, in Burlington township	7,264
Mount Holly, including township	5,376

CAMDEN COUNTY.

Camden, city	58,313
Gloucester, city	6,564
Haddonfield, borough, in Haddon township	2,502
Merchantville, borough, in Stockton township	1,225

CAPE MAY COUNTY.

Cape May, city	2,136

CUMBERLAND COUNTY.

Bridgeton, city	11,424
Millville, city	10,002
Vineland, in Landis township	3,822

ESSEX COUNTY.

Belleville, including township	3,487
Bloomfield, including township	7,708
East Orange, Including township	13,282
Irvington, village, including township	3,684
Montclair, including township	8,656
Newark, city	181,830
Orange, city	18,844
South Orange, village	3,106

GLOUCESTER COUNTY.

Woodbury, city, in Deptford township	3,911
Swedesboro, town	2,035

HUDSON COUNTY.

Bayonne, city	19,033
Guttenberg, town	1,947
Harrison, city	8,338
Hoboken, city	43,648
Jersey City, city	163,003
Union, town	10,643

HUNTERDON COUNTY.

Clinton, town	2,888
Frenchtown, borough	1,023
Lambertville, city	4,142

MERCER COUNTY.

Hightstown, borough, West Windsor township	1,875
Princeton, borough	3,422
Trenton, city	57,458

MIDDLESEX COUNTY.

Dunellen, borough	1,060
New Brunswick, city	18,603
Perth Amboy, city	9,512
South Amboy, borough	4,330

MONMOUTH COUNTY.

Asbury Park, borough, including Neptune township	5,579
Freehold, town	2,932
Ocean Grove	2,754
Red Bank	4,145

Long Branch	7,231
Keyport, Raritan township	3,411
Manasquan, town	1,506

MORRIS COUNTY.

Boonton	2,981
Dover	*3,500
Morristown, town	8,156

OCEAN COUNTY.

Only townships.

PASSAIC COUNTY.

Passaic, city	13,028
Paterson, city	78,347

SALEM COUNTY.

Salem, city	5,516

SOMERSET COUNTY.

Somerville, town	3,861
Raritan, borough	2,556
Bound Brook, borough	1,462

SUSSEX COUNTY.

Newton, town	3,003

UNION COUNTY.

Elizabeth, city	37,764
Rahway, city	7,105
Plainfield, city	11,267

WARREN COUNTY.

Belvidere, town	1,768
Hackettstown, town	2,417
Phillipsburg, city	8,644
Washington, borough	2,834

According to this, we find that of the 1,444,933 of the inhabitants of New Jersey, about 910,366 live in cities or some form of incorporated towns of over 1,000 inhabitants. When our vital statistics reach over a greater number of years, there will be still more opportunity to study the effects of locality and of different density of population upon life and health as also upon local prosperity. From these we at present select out and associate cities and towns according to population.

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* Estimated.

OVER ONE HUNDRED THOUSAND.

Newark, Essex county	181,830
Jersey City, Hudson county	163,003

NOTE.—Hoboken is so near to Jersey City that its close proximity must be borne in mind in all vital study. The same is partly true of some of the suburbs of Newark.

BETWEEN SEVENTY-FIVE AND ONE HUNDRED THOUSAND.

Paterson	78,347

BETWEEN FIFTY AND SEVENTY-FIVE THOUSAND.

Camden	58,313
Trenton	57,458

BETWEEN TWENTY-FIVE AND FIFTY THOUSAND.

Elizabeth, city, Union county	37,764
Hoboken, Hudson county	43,648

FROM FIFTEEN TO TWENTY-FIVE THOUSAND.

Bayonne, Hudson county	19,033
New Brunswick, Middlesex county	18,603
Orange, Essex county	18,844

FROM TEN TO FIFTEEN THOUSAND.

Atlantic City, Atlantic county	13,055
Passaic City, Passaic county	13,028
Bridgeton, Cumberland county	11,424
Plainfield, Union county	11,267
Union, Hudson county	10,643
Millville, Cumberland county	10,002

FROM FIVE TO TEN THOUSAND.

Perth Amboy, Middlesex county	9,512
Phillipsburg, Warren county	8,644
Harrison, city, Hudson county	8,338
Morristown, city, Morris county	8,156
Burlington, city, Burlington county	7,264
Long Branch, city, Monmouth county	7,231
Rahway, city, Union county	7,105
Gloucester City, Camden county	6,564
Hackensack, Bergen county	6,004
Salem, city, Salem county	5,516

FROM ONE TO FIVE THOUSAND.

Atlantic County—	
Egg Harbor City	1,439
Hammonton	3,833
Burlington County—	
Beverly City	1,957
Bordentown, city	4,232
Camden County—	
Haddonfield	2,502
Merchantville	1,225
Cape May County—	
Cape May, city	2,136
Cumberland County—	
Vineland	3,822
Essex County—	
Belleville	3,487
Irvington, village	3,684
South Orange, village	3,106
Gloucester County—	
Woodbury, city	3,911
Swedesboro, town	2,035
Hudson County—	
Guttenberg, town	1,947
Hunterdon County—	
Clinton, borough	1,975
Frenchtown, borough	1,023
Lambertville, city	4,142
Mercer County—	
Hightstown, borough	1,875
Princeton, borough	3,422
Middlesex County—	
Dunellen, borough	1,060
South Amboy, borough	4,330
Monmouth County—	
Freehold, town	2,932
Ocean Grove	2,754
Red Bank	4,145
Keyport	3,411
Manasquan	1,506

Morris County—	
Boonton	2,981
Dover	*3,500
Somerset County—	
Bound Brook, borough	1,462
Raritan, borough	2,556
Somerville, town	3,861
Warren County—	
Belvidere, town	1,768
Hackettstown, town	2,417
Washington, borough	2,834

From the data here given, and from the record of our reports, each locality can find its proportion of marriages, births and deaths according to its varying population. As, however, inferences of healthfulness or other vital facts are incomplete, except when dealing with large numbers, we only attempt calculations based upon counties and cities of over 5,000 inhabitants.

These various facts are put on record in order to aid the Central Bureau and all Local Boards in their study and calculation of vital statistics. It is also desirable to know the number of houses in each city in proportion to the population, the make-up of the population of each city as to sex, nationality, &c., and various other items. Some of these facts were secured and presented in the State census of 1880, and we shall avail ourselves of various other items when all the details of the National census are complete. During the past year there were 18,000 foreigners settled in New Jersey, but we do not know as to their exact distribution. But the facts we have and which are herewith presented are the starting-points for calculation as to ratios of increase and death-rates, and can be supplemented from time to time as provision therefor permits.

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* Estimated.

CORONER SYSTEMS AND OUR PRESENT CORONER LAWS.

BY MESSRS. S. W. ABBOTT, M.D., CARROLL ROBBINS, COUNSELOR-AT-LAW, AND E. M. HUNT, M.D.

The sudden deaths or deaths by violence form no small proportion of the aggregate mortality in this State. Added to the ordinary cases of quick disease are the many deaths which result from our long line of sea-shore, our numerous rivers, lakes and bays, the length of railroad and number of termini, and other active transportation on roads and water-ways, as well as the machinery incident to a State so largely engaged in manufacturing industries. While our statistics do not accurately reveal all of these, we have reason to believe that about one-twentieth of all the deaths that occur are such as are liable to invoke the services of a Coroner. Numbers of these cases involve great questions as to the public health and welfare, as to the protection of life and limb, and as to the suppression or punishment of criminal negligence or of actual intent to kill. It is all-important that any laws which look to the guarding and proper issue of these great interests should be clear in their statutes, facile and searching in their methods and radical and effective in their results. It is the design of this brief article to show the defects of the usual or old Coroner system, to present a model of what is feasible and of what has been found to be a great improvement both as to its effectiveness and economy; to present our own present law, with its slight but insufficient modification, and to urge such legislation as shall be more in accord with the progress of medical and legal knowledge and with that facility and thoroughness with which laws for the protection of human life should be framed and executed. To this end we shall present a brief abstract of a paper furnished to "The Forum," August, 1889, by S. W. Abbott, M.D., Secretary of the State Board of Health of Massachusetts, with the law and personal notes kindly furnished to us since, from his own large experience; with an outline of our State law, prepared by Carroll Robbins, counselor-at-law, of Trenton, N. J., and accompanying facts and suggestions by the Secretary of this Board. From Dr. Abbott's papers we quote as follows:

"The Coroner system of England, and most English-speaking countries, except Scotland, has had an existence of at least a thousand years. It was in use in the days of King Alfred, and has become so interwoven with and burnt into the laws and customs of the Anglo-Saxon race that any attempt to substitute an improved method has met with bitter opposition. The functions of the old-time Coroner were much more comprehensive than at present. In addition to the duty of holding inquests upon the bodies of persons found dead from violent, sudden and suspicious causes, he was also charged with the duty of inquiring as to the causes of incendiary fires, shipwrecks, treasure-trove on land and sea, including whales and sturgeons cast up on the shore. He was also occasionally required to act in the absence of the Sheriff. Most of these extraneous duties have one after another been shorn away, and the ends of justice would be much better served if the office were everywhere abolished and a more intelligent, reasonable and economical method introduced in its stead.

"Attempts have been made in some countries to modify the system by the requirement that the office should always be filled by a physician. The objection to this method is that it requires that one man shall perform two entirely different functions, involving distinct lines of training: law and medicine. For while professional men occasionally are proficient in both of these branches of learning, the instances in which the judge and the physician are combined in one person are extremely rare. The object of a medico-legal inquiry is the detection of crime, and the points to be sought for are twofold, namely, the immediate cause of death, and person or persons who caused the death. The first of these questions is of a purely medical character, and in many cases can be answered in a satisfactory manner only by a thoroughly-educated medical man. Not only should he have a medical education, but he should also possess a special fitness for conducting a post-mortem inquiry. The performance of an autopsy in a thorough and skillful manner is frequently an absolute necessity in a medico-legal investigation.

"The second question naturally follows the first, and the solution of the first often leads directly to the solution, at least in part, of the second, as, for instance, when it determines whether a man died by his own act or by the act of another. Very often an autopsy, or at least an external medical inspection, is required to settle this question.

"John Smith's body is found in a thicket, remote from habitation, with a bullet hole in the head. An autopsy may be necessary to determine the question of the direction of the ball, and also whether the missile was fired by his own hand or by another's. The second question, as to the authŏr of the deed (when committed by another), naturally follows the first, and should be committed to a man of judicial training.

"The principal features of the Coroner's inquest are essentially the same in all parts of the Union. The officials concerned in an inquiry as to the cause of death by violence, are the Coroner and the jury. It may reasonably be asked for what purpose the latter body exists. Whenever a Coroner's jury by their verdict fix a crime upon an individual, the same evidence which has convinced them is again rehearsed before a court of law, and usually in a much more thorough manner. Wherefore the expense of two tribunals sitting and deciding upon the same question? Another evidence of the uselessness of the Coroner's inquest is the greater facility with which medico-legal inquiries are conducted in countries where Coroners' juries are unknown. It is not our purpose to criticise the jury system in general, but only so far as it plays a part in the Coroner's inquest. The ordinary jury of courts of law is called upon to consider questions having a very wide bearing, both of a civil and of a criminal nature. Financial and other business transactions, pertaining to the dealings of men with each other in the daily walks of life, are among the most common questions submitted to the test of trial by jury. Of these, every man having an ordinary amount of common sense and liable to jury duty is expected to have some knowledge and can usually form an opinion.

"The question properly and directly before a Coroner's jury is one and one only: What was the cause of death?

"While in many cases this question may be so clear as not to require the intervention of an expert, it is also true that cases are of frequent occurrence in which no jury, selected as juries usually are, can comprehend the exact cause of death. The question is a purely medical one, and as such requires a thorough knowledge of anatomy, chemistry, materia medica and toxicology. A knowledge of pathology is especially necessary in certain cases wherein a considerable length of time has elapsed between the primary injury and the fatal result. Under such circumstances a thorough medical training is absolutely essential. It is for these reasons that no tribunal has been subjected to so much well-merited ridicule as the Coroner's inquest. Scarcely a week passes in which a verdict is not recorded in some part of the country proving the failure of the Coroner system to accomplish its work in a manner which is at all creditable or satisfactory. From time to time lawyers, physicians and others having to do with inquests and legal proceedings were led to comment upon the defects of the system. The more examination was had the more apparent was the inefficiency of the old system and the inherent incongruity of an office requiring expert knowledge of law and of medicine combined in one office."

The matter was taken up by members of the legal fraternity and by the Massachusetts Medical Society, aided by T. H. Tyndale, who framed the original Massachusetts law.

The facts and arguments adduced made a strong impression upon the public, the press and competent authorities in law and in medicine, so that in 1877 the old system was superseded by the new, and the working of this has been, in every respect, satisfactory. Dr. Abbott says "so far as Massachusetts is concerned the old Coroner system is dead and buried and no one can be found in the State who is desirous of its resurrection." We now give the law as it at present exists in that State:

SUBSTITUTE FOR CORONER LAW.

Law Relating to Medical Examiners.

[Public Statutes, Chapter 26.]

OF MEDICAL EXAMINERS.

SECTION 1. The governor shall nominate, and by and with the advice and consent of the council shall appoint, in each county, able and discreet men, learned in the science of medicine, to be medical examiners in each county, and every such nomination shall be made at least seven days prior to the appointment.

SEC. 2. The number of medical examiners, appointed as provided in the preceding section, shall be as follows:

[Limits of districts omitted.]

SEC. 3. The governor may also, in like manner, nominate and appoint an associate medical examiner for the county of Suffolk,* who shall, at the request of either of the medical examiners for said county, perform all the duties and exercise all the powers of a medical examiner in said county, but he shall not in any year be so required to serve for more than one month at the request of either of said medical examiners.

SEC. 4. Said medical examiners and associate medical examiner shall hold their offices for a term of seven years from the time of their respective appointments, but shall be liable to removal from office by the governor and council at any time for cause shown.

SEC. 5. Each medical examiner and the associate medical examiner for Suffolk county shall, before entering upon the duties of his office, be sworn and give bond with sureties to the treasurer of the county, in the sum of five thousand dollars, for the faithful performance of such duties; if he fails to give such bond for thirty days after his appointment, such appointment shall be void.

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* Includes Boston.

SEC. 6. The superior court shall each year examine into the sufficiency of all bonds given under the preceding section; and if it appears that any such bond is insufficient, said court shall cause a record of that fact to be made by its clerk, and shall require the party who gave such bond to give a new one, satisfactory to the court, within such time as it shall order.

SEC. 7. A surety on any such bond, or his heirs, executors or administrators, may petition the superior court for the county for which the officer who gave it was appointed, to be discharged from such bond, and like proceedings shall thereupon be had as in case of a similar petition by a surety on a sheriff's official bond.

SEC. 8. If the condition of any such bond is broken to the injury of any person, the officer who gave it shall be liable to removal from his office and be subject to like penalties as sheriffs in like cases, and actions may be brought upon such bonds in like manner as upon the official bonds of sheriffs.

SEC. 9. In the county of Suffolk, each medical examiner shall receive from the treasurer of the county, in full for all services performed by him, a salary of three thousand dollars a year, and the associate medical examiner a salary of five hundred dollars; but if the said associate medical examiner serves in any year more than two months, at the request of either medical examiner, he shall, for such service in excess of two months, be paid at the same rate as such medical examiner, and such compensation shall be deducted from the salary of the medical examiner in whose stead he serves; the medical examiners in other counties shall receive fees as follows: for a view without an autopsy, five dollars; for a view and autopsy, thirty dollars, and for travel, at the rate of ten cents a mile to and from the place of view.

SEC. 10. Medical examiners shall make examinations, as hereinafter provided, upon the view of the dead bodies of such persons only as are supposed to have come to their death by violence.

SEC. 11. When a medical examiner has notice that there has been found, or is lying within his county, the dead body of a person who is supposed to have come to his death by violence, he shall forthwith repair to the place where such body lies, and take charge of the same; and if, on view thereof and personal inquiry into the cause and manner of the death, he deems a further examination necessary, he shall, upon being thereto authorized in writing by the district attorney, mayor or selectmen of the district, city or town where such body lies, make an autopsy in the presence of two or more discreet persons, whose attendance he may compel by subpœna if necessary, and shall then and there carefully reduce or cause to be reduced to writing every fact and circumstance tending to show the condition of the body and the cause and manner of death, together with the names and addresses of said witnesses, which record he shall subscribe;

before making such autopsy he shall call the attention of the witnesses to the position and appearance of the body.

SEC. 12. If upon such view, personal inquiry or autopsy he is of opinion that the death was caused by violence, he shall at once notify the district attorney and a justice of the district, police or municipal court for the district or city in which the body lies, or a trial justice, and shall file a duly-attested copy of the record of his autopsy in such court or with such justice, and a like copy with such district attorney; and shall in all cases certify to the clerk or registrar having the custody of the records of births, marriages and deaths in the city or town in which the person deceased came to his death, the name and residence of the person deceased, if known, or, when the name and residence cannot be ascertained, a description of the person deceased, as full as may be, for identification, together with the cause and manner by and in which he came to his death.

SEC. 13. The court or trial justice shall thereupon hold an inquest, which may be private, in which case any or all persons, other than those required to be present by the provisions of this chapter, may be excluded from the place where such inquest is held; and said court or trial justice may also direct the witnesses to be kept separate, so that they cannot converse with each other until they have been examined; the district attorney, or some person designated by him, may attend the inquest and examine all witnesses; an inquest shall be held in all cases of death by accident upon a railroad, and the district attorney or the attorney general may, if he deems it necessary or expedient, direct an inquest to be held in the case of any other casualty from which the death of a person results.

SEC. 14. The justice or district attorney may issue subpœnas for witnesses, returnable before such court or trial justice; the persons served with such process shall be allowed the same fees, their attendance may be enforced in the same manner, and they shall be subject to the same penalties as if served with a subpœna in behalf of the commonwealth in a criminal prosecution pending before such court or trial justice.

SEC. 15. The presiding justice or trial justice shall, after hearing the testimony, draw up and sign a report, in which he shall find and certify when, where and by what means the person deceased came to his death, his name, if known, and all material circumstances attending his death; and if it appears that his death resulted wholly or in part from the unlawful act of any other person or persons, he shall further state the name or names of such person or persons, if known to him, and he shall file such report with the records of the superior court in the county wherein the inquest is held.

SEC. 16. If the justice finds that murder, manslaughter or an assault has been committed, he may bind over, as in criminal prosecutions, such witnesses as he deems necessary, or as the district attorney may designate, to appear and testify at the court in which an indictment for such offense may be found or presented.

SEC. 17. If a person charged by the report with the commission of an offense is not in custody, the justice shall forthwith issue process for his apprehension, and such process shall be made returnable before any court or magistrate having jurisdiction in the premises, who shall proceed therein in the manner required by law; but nothing herein shall prevent any justice from issuing such process before the finding of such report, if it is otherwise lawful to issue the same. [Amended 1887, 310, § 3.]

SEC. 18. If a medical examiner reports that a death was not caused by violence, and the district attorney or the attorney-general is of a contrary opinion, either the district attorney or the attorney-general may, notwithstanding such report, direct an inquest to be held in accordance with the provisions of this chapter, at which inquest he or some person designated by him shall be present and examine all the witnesses.

SEC. 19. The medical examiner may, if he deems it necessary, employ a chemist to aid in the examination of the body or of substances supposed to have caused or contributed to the death, and such chemist shall be entitled to such compensation for his services as the medical examiner certifies to be just and reasonable, the same being audited and allowed in the manner hereafter provided; a clerk, who may be employed to reduce to writing the results of a medical examination or autopsy, shall be allowed for his services two dollars per day.

SEC. 20. When a medical examiner views or makes an examination of the dead body of a stranger, he shall cause the body to be decently buried; and if he certifies that he has made careful inquiry, and that to the best of his knowledge and belief the person found dead is a stranger having no settlement in any city or town of this commonwealth, his fees with the actual expense of burial shall be paid from the treasury of the commonwealth. In all other cases the expense of the burial shall be paid by the city or town, and all other expenses by the county, wherein the body is found. [Amended 1887, 310, § 1.]

SEC. 21. When services are rendered in bringing to land the dead body of a person found in any of the harbors, rivers or waters of the commonwealth, the medical examiner may allow such compensation for such services as he deems reasonable, but this provision shall not entitle any person to compensation for services rendered in searching for a dead body.

SEC. 22. In all cases arising under the provisions of this chapter, the medical examiner shall take charge of any money or other personal property of the deceased, found upon or near the body, and shall deliver the same to the person or persons entitled to its custody or possession, or, if not claimed by such person within sixty days, then to a public administrator, to be administered upon according to law.

Sec. 23. A medical examiner who fraudulently neglects or refuses to deliver any such property to such person within three days after due demand upon him therefor shall be punished by imprisonment in the jail or house of correction, not exceeding two years, or by fine not exceeding five hundred dollars.

Sec. 24. Every medical examiner shall return an account of the expenses of each view or autopsy, including his fees, to the county commissioners having jurisdiction over the place where the examination or view is held, or in the county of Suffolk to the auditor of the city of Boston, and shall annex to his return the written authority under which the autopsy was made; such commissioners or auditor shall audit such accounts, and certify to the treasurer of the commonwealth or to the treasurer of the county, as the case may be, what items in such accounts are deemed just and reasonable, and such items shall be paid by said treasurer to the person entitled to receive the same. [Amended 1887, 310, § 2.]

Sec. 25. The fees of trial justices for the services specified in this chapter shall be as follows, namely: for receiving and filing a duly-attested copy of the record of an autopsy, fifty cents; for each subpœna issued, ten cents; for each day's attendance in holding the inquest, five dollars; for the recognizance of witnesses, twenty cents; and for drawing up and filing a report in superior court, five dollars; the said fees, having been audited by the district-attorney, shall be paid from the treasury of the county.

IMPORTANT AMENDMENTS ENACTED IN 1885 AND 1887.

Sec. 2. When a medical examiner deems it necessary to have a physician present at an autopsy as one of the witnesses, as provided in section eleven of chapter twenty-six, of the Public Statutes, such physician shall be allowed five dollars for his services; other witnesses required by law to be present at an autopsy shall be allowed two dollars each.

Sec. 3. Every medical examiner shall, annually, on or before the first day of March, transmit to the secretary of the commonwealth certified copies of the records of all deaths which have occurred during the year ending on the last day of the preceding December, the cause and manner of which he has investigated, in accordance with the requirements of chapter twenty-six of the Public Statutes; *provided, however*, if the term of office of any medical examiner shall end before the said last day of December, he shall send to the secretary of the commonwealth, within the sixty days next ensuing upon the expiration of his commission as a medical examiner, certified copies of the records of all deaths officially investigated by him during that part of the then current calendar year in which he continued in office.

SEC. 4. Each medical examiner shall be entitled to receive from the treasury of the commonwealth, for recording and returning the facts relating to deaths as herein provided, twenty cents for each of the first twenty entries, and ten cents for each subsequent entry in any year, as certified by the secretary of the commonwealth, and such allowance and payment shall be made to the medical examiners in Suffolk County for record and returns pursuant to this section, notwithstanding the limitation to the salary fixed by section nine of chapter twenty-six of the Public Statutes as amended by this act; any medical examiner shall forfeit not less than ten nor more than fifty dollars for each refusal or neglect to fulfill the requirements of section three of this act.

SEC. 5. The secretary shall, at the expense of the commonwealth, prepare and furnish to the several medical examiners, blank books of suitable quality and size, to be used as books of record under this act, and blank forms for returns, on paper of uniform size.

SEC. 6. The secretary shall cause the returns received by him for each year, in accordance with this act, to be bound together in one volume, with indexes thereto; he shall prepare or cause to be prepared from the said returns such tabular results as will render them of practical utility, and shall make report thereof annually to the general court in connection with the report of the registry and return of births, marriages and deaths required by section fifteen of chapter thirty-two of the Public Statutes.

SEC. 7. Every medical examiner shall forthwith file with the district attorney of the district, a report of each autopsy made by him and of his view and personal inquiry in such case under the provisions of chapter twenty-six of the Public Statutes; and shall certify in such report that, in his judgment, the cause and manner of death could not be ascertained by view and inquiry, and that an autopsy was necessary for that purpose; the district attorney shall examine such report, and if of the opinion that such autopsy was necessary shall, except in the county of Suffolk, so certify to the county commissioners having jurisdiction over the place where the autopsy is held, and no fee for any autopsy shall be certified by the commissioners for payment until such certificate by the district attorney shall have been filed with said commissioners.

SEC. 8. This act shall take effect upon its passage.

Approved June 19th, 1885.

[Statutes 1887, Chapter 310.]

AN ACT RELATING TO MEDICAL EXAMINERS.

Be it enacted, &c., as follows:

SEC. 2. Section twenty-four of chapter twenty-six of the Public Statutes is hereby amended so as to read as follows: Every medical examiner shall return an account of the expenses of each view or autopsy, including his fees, to the county commissioners having jurisdiction over the place where the examination or view is held, or in the county of Suffolk to the auditor of the city of Boston, and shall annex to his return the written authority under which the autopsy was made; such commissioners or auditor shall audit such accounts and certify to the treasurer of the county what items in such account are deemed just and reasonable, and such items shall be paid by said treasurer to the person entitled to receive the same.

SEC. 4. This act shall take effect upon its passage.

Approved May 26th, 1887.

This law abolishing the Coroner system in Massachusetts has now stood the test of fourteen years' trial, and about 16,000 cases of violent, sudden and suspicious deaths have been examined in the State under its provisions. The change from the old system to the new was radical and thorough. It is no exaggeration to say that the present law has been one of the most satisfactory in its operation of any that have ever been enacted in the State.

SYNOPSIS OF PRINCIPAL FEATURES AND RESULTS.

The principal features in the foregoing act, which constitute the chief difference between the Medical Examiner system of Massachuetts and the Coroner system, are the following:

1. The separation of the medical from the legal duties involved in the investigation of the cause of death, the former being intrusted to medical officers ("able and discreet men, learned in the science of medicine") (Sections 2–9, 16–21, Acts of 1877, Chapter 200; and the latter to properly-qualified legal magistrates, Sections 10–14).
2. The abolition of the Coroner's office, and also of the jury (Section 1 *et seq.*)
3. The limitation of the number of medical officers (Sections 2, 6).

This law is the result of a successful attempt to introduce into a New England commonwealth, imbued with a traditional adherence to old and firmly-established customs, the plan of continental Europe modified and adapted to a republican form of government.

As may be seen by an examination of Section 8 of the present law of Massachusetts, the medical officer takes the initative steps in the investigation of each case requiring the exercise of his duties. This method of procedure rests upon the assumption of a natural sequence in the investigation of all cases of death by violence.

The *inquest* is held by the court, and is the inquiry into the facts outside the body; the *examination* is made by the (medical) examiner, and it leads the way to the inquest.

The purpose of the law is the detection of crimes; its method, the division of functions among those properly qualified to perform them.*

The operation of this law has been thoroughly tested in Massachusetts since its enactment in 1877, during which time the examination of at least sixteen thousand cases has been carefully conducted, and the advantage gained by the change has been successfully demonstrated.

FINANCIAL RESULTS.

Financially, the Medical Examiner system has also proved successful. Comparing the cost of Coroner's inquests and views in Massachusetts for three years under the old law (1874, 1875, and 1876) with the cost of similar inquiries under the new law for a like period (1878, 1879, and 1880), as nearly as could be ascertained, the result was for the former period, $63,712.04, and for the latter, $54,509.31, leaving a difference of $9,202.73 in favor of the Medical Examiner system, notwithstanding an increase of population between the two periods of at least one hundred thousand, and a consequent increase in the amount of work done.

The chief causes of this diminution in expense are the abolition of the Coroner's jury, and the decrease in the number of inquests. In the three years specified under the old law, there were held in three counties in Massachusetts *one hundred and twenty-four inquests.* In three years, under the new law, with a larger population, the number of inquests held in the same counties was but *seventy-five.*

Under the old law the ratio of inquests to cases of all sorts examined throughout the whole State was about forty per cent. Under the Medical Examiner law the ratio has not been more then twenty-two per cent. "The reasons for this change may be found in the appointment, to fill the offices formely held by Coroners, of men whose education necessarily fits them for the work which they are expected to perform. Under the old law a man found dead, even without the least suspicion of violence, as in simple cases of heart disease or apoplexy, would in all probability be reported to the village Coroner, provided the most common hypostatic marks of post-mortem discoloration were observed by a bystander, and interpreted by him as significant of a violent death. Hence the Coroner sets in motion the cumbrous machinery of his office. In the first place he sends for a Constable. The Constable summons a jury. The witnesses come next; and last of all, the nearest physician is summoned, whose evidence finally shows that the man died a natural death. Under the working of the present law the order of procedure is reversed. The medical officer first views the body, and in a case like that just cited he simply reports it as a view. If, however, he believes there is reasonable suspicion of violence, as revealed by the evidence shown him from an external examination of the body, and a personal inquiry of the witnesses, and also by an autopsy, if that be requisite, the case is then reported to the proper authorities for inquest.*

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* Tyndale.

After the Medical Examiner law had been in operation for a period of seven years and a half, the Legislature of 1885 carefully considered certain measures which were proposed for the further improvement of the existing law. These were the reporting of cases to some central authority who should be intrusted with the compilation, classification and publication of the returns of the Medical Examiners; the proper remuneration of medical witnesses at autopsies; and a provision for more definite authority for making autopsies on the bodies of persons found dead.

The following condensed summary gives the number of cases investigated under the Medical Examiner system for the five years 1885 to 1889 inclusive.

YEAR.	SEX.						Totals.
	Males.	Per Cent.	Females.	Per Cent.	Unspecified.	Per Cent.	
1885	973	76.1	286	22.4	19	1.5	1,278
1886	1,027	74.5	319	23.2	32	2.3	1,378
1887	1,191	76.5	350	22.5	15	1.0	1,556
1888	1,261	76.4	373	22.6	17	1.0	1,651
1889	1,253	75.8	388	23.4	13	0.8	1,654
Totals	5,705	75.9	1,716	22.8	96	1.3	7,517

The expenses of the four years 1885 to 1889 were as follows:

YEAR.	Total Number of Cases Examined.	Autopsies.	Total Expenses.	Average Expense of Each Case.
1885	1,260	165	$16,322 54	$12 95
1886	1,378	202	18,024 22	13 08
1887	1,556	188	18,626 26	11 97
1888	1,651	219	19,611 53	11 88
1889	1,654	216	19,489 69	11 78

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* Transactions of Mass. Medico-Legal Society, Vol. 1, p. 207.

Similar laws, although modified in some degree, have been passed more recently by Connecticut and Rhode Island. The American Medical Association and the Medico-Legal Society of New York City have expressed themselves fully as to their views of the inadequacy of the old system. Indeed, we have yet to find physicians, jurors or lawyers, who have investigated the subject, who do not agree as to the need of change. We quote as follows from the "Medical Record" of June, 1891:

> "Our Coroner system is a vicious one, though it is better than it used to be. We live in expectation that someday the New York Medico-Legal Society and the New York Society of Medical Jurisprudence will amalgamate, and then united efforts to promote medico-legal science may be undertaken. One of the first things to happen in this millennial time will be the death of our present antiquated, political Coroner system."

In an able paper recently read before the New York Academy of Medicine, Prof. Stephen Smith, M.D., says: "The Coroner system is a relic of the past and should become as obsolete as it is ancient." He then discusses the system in full and presents as a substitute slight modifications of the Massachusetts law.

II.

SYNOPSIS OF PRESENT NEW JERSEY LAWS AS TO CORONERS, COUNTY PHYSICIANS AND INQUESTS.

BY CARROLL ROBBINS, COUNSELOR-AT LAW.

The act entitled "An act respecting coroners," approved March 27th, 1874, with its several supplements provides that there shall be elected three Coroners for each county, the election to be held at the time of the election of members of the Assembly, and their term of office three years.

Whenever a vacancy occurs in the office the Governor may fill it by appointment, such appointee's term expiring at the ensuing general election (P. L. 1882, p. 12).

No qualification is required except that the candidate be an inhabitant of the county, and before entering upon his office he shall take an oath to discharge his duty properly.

(For form of oath, see Rev., p. 169, Section 2.)

Every Coroner shall have power, upon view of the body, to take inquests of deaths in prison, and of all violent, sudden or casual deaths within his county, and the manner of such deaths (Rev., p. 170, Section 3).

A Justice of the Peace may act when a Coroner cannot be had in due time (Ib., Section 4).

The Coroner on being informed of the violent, sudden or casual death of any person within his county shall immediately view the body and make inquiries, and if he is satisfied that no person has been guilty of causing or procuring said death and that there are no suspicious circumstances attending the same, he shall deliver up the body to the friends for interment, or shall bury it if the dead person have no friends to take charge of it and no property to pay the expenses (Ib., Section 5).

Where inquests are not taken, the Coroner shall make a certificate to the effect that he deems an inquest unnecessary, and in case no friends take charge of the body and the decedent had no property, he shall further certify that he buried the same (Ib., Section 6).

If after view and inquiry the Coroner shall have reason to suspect that the decedent has been foully dealt with, he shall make out a precept to a Constable, requiring him to summon a jury of not less than nine nor more than fifteen men.

Of the jurors who shall appear the Coroner shall swear six or more as a jury to inquire into the facts, and they shall find (Ib., Section 11) whether the decedent died by murder, manslaughter, misadventure, misfortune, accident or otherwise, and when and where and by what means, and in what manner; and if by murder, who were principals and who were accessories; and if by manslaughter, who were the perpetrators, and with what instrument the stroke or wound was in either case given, and so of all prevailing circumstances which may come by presumption; and if by misadventure, misfortune, accident or otherwise, whether by the act of God or man, and whether by hurt, fall, stroke, drowning or in any other way; to inquire what persons were present at the death, from whence the deceased came, and who he or she was, and his or her parents, relatives or neighbors; who were the finders of the body; whether killed in the same place where he or she was found, or if elsewhere, by whom and how he or she was brought from thence, and of all circumstances relating to said death; and if he or she died in prison, whether by hard usage there or not, and if so, how and by whom; and if he or she put an end to his or her own life, then to inquire of the manner, means or instrument, and of all the circumstances concerning it.

The Coroner has power to summon witnesses (Ib., Section 12).

He is also required to return his inquisition to the next Court of Oyer and Terminer and General Jail Delivery in his county, and the court is to proceed against the offenders.

The Coroner is further required to reduce to writing all of the evidence which is material, and to bind over as witnesses those declaring anything material to prove murder or manslaughter, or to prove persons accessories, to appear at the next court, and if accused is not already in custody he may issue a warrant for his arrest as Justices of the Peace do.

Section 15 of the same act provides that the Coroner, when he deems it necessary to have a post-mortem examination, shall call to his aid one or more licensed physicians or surgeons of the State for the purpose, and on certificate of the Coroner the Freeholders of the county where the body was found shall pay the physicians a reasonable compensation.

Where dead bodies are thrown upon shores or coasts by shipwreck the Coroner of county shall make written statement containing name of ship, date of wreck, place where it occurred together with full description of body as he can give, and also time and place of burial, and shall file statement under oath with the State Treasurer.

If no Coroner or Justice of the Peace can be had in due time, a Commissioner of Wrecks may discharge the duty of the Coroner in case of shipwrecks.

A person finding a dead body and giving notice to proper officers is entitled to a fee of fifty cents and five cents a mile as mileage.

It is the duty of the Coroner to provide graveclothes for bodies found in a state of nudity.

For neglect of duty a Coroner or Justice of the Peace, who under the circumstances is bound to discharge the duties of the Coroner's office, may be fined a sum not exceeding five hundred dollars.

The expenses of inquests are borne by the county where the body is found, though inquest held in another county, except in cases of shipwreck, shall be paid by the State Treasurer.

The fees of a Coroner are taxed by the County Clerk, and Coroners must be sworn as to the correctness of bills presented and amounts paid for jurors' and witness fees.

If in any case it appears to the Coroner necessary to have a chemical analysis made of a substance suspected of having occasioned death, he shall report to a Justice of the Supreme Court, who shall have power in his discretion to order such analysis to be made and to certify the expense, which shall then be paid.

(For Coroners' fees and other expenses incident to the holding of inquests, see Supplement to Revision, pp. 141, 142, 796)

This is a brief statement of the salient features of the law respecting Coroners in this State as it is applicable to all counties where there are no County Physicians; and it is also in force in all counties where there are County Physicians, except as modified by the acts creating and relating to such office.

By the act of April 21st, 1876 (P. L. 1876, p. 379), it was provided that the Board of Chosen Freeholders of any county in the State, whenever they deem it best to do so, may elect a County Physician from the number of licensed physicians residing in such county, who shall hold office for three years and on such salary as they deem just, to be fixed from time to time, as such elections shall be made.

Before entering upon his duties said County Physician shall be sworn faithfully and fairly to perform the duties of his office.

It is his duty in all cases of death in prison, and all violent, sudden or casual deaths within his county, to take a view of the body, and make all proper inquiry respecting the cause and manner of the death, for the purpose of ascertaining whether an inquest should be held; and if upon such view and inquiry he shall be of opinion that there is cause to suspect that the person whose body he has been called to view, came to his or her death by murder or manslaughter, or by the contrivance, aiding, procuring or other misconduct of any person or persons, then it shall be his duty to call upon one of the Coroners of the county, or if such Coroner cannot be had, upon a Justice of the Peace of said county, and request him in writing to issue the precept for the summoning of a jury of inquisition, to consist of not more than fifteen nor less than nine, and to hold an inquest and make return of the same according to law, and any post-mortem examination or other medical service required upon said inquest shall be performed by said County Physician (Rev., p. 818, Section 2).

In case of vacancy in office of County Physician the Coroners and Justices of the Peace shall perform the duties and exercise the powers prescribed by law (Ib., Section 3).

When the County Physician is sick or unable to discharge any duty of the office, he may nominate and appoint in writing under his hand any other licensed physician in the county to act for him, and the County Physician shall pay him (Ib., Section 4).

In all cases where a County Physician shall be elected and qualified and fulfilling his office, he shall have exclusive right and power to make all views and inquiries heretofore made by Coroners and Justices of the Peace; and no precept for the summoning of a jury of inquest shall be issued by any Justice or Coroner of any county where a County Physician shall be acting as aforesaid, except by the written request of said physician made as aforesaid; and the request so made by such physician shall be annexed to the inquest made and returned by said Coroner or Justice (Ib., Section 5).

By the act of April 5th, 1878 (Sup. Rev., p. 795), the former act respecting County Physicians was so extended as to compel the election of such an officer in all counties having a population of not less than 50,000 inhabitants.

(As to disposition of personal property of decedent by County Physician or Coroner, see Supplement to Revision, page 796, Section 3.)

We quote briefly from Mr. Robbins' letter of transmittal as follows:

> "I think the matter one of such importance that it should be placed in the hands of thoroughly competent officers to deal with it, and while the appointing of County Physicians may have been a step in advance of the old methods there certainly is room for great improvement yet in the system. I think the Coroner or person presiding at an inquest should be a man of legal education and experience, and competent to deal with the matters and questions arising there with considerable skill. It appears that the act creating the office of County Physician merely takes from the Coroner the power of deciding whether there shall be an inquest in any case, and names a person who shall do and perform any medical service which may be needed at such inquest."

It may be claimed by some that our present law is an approach toward the Massachusetts law. So it is, but yet so imperfect as to preserve some of the worst features of the former law.

I. It retains the office of Coroner and the jury system.

II. It does not recognize that in many cases at a very early stage the District Attorney or other legal officer should be identified with the case.

III. It does not diminish expense.

IV. It leaves a conflict of authority between County Physicians and Coroner, unless in their mutual interest they have some understanding as to how far one or the other is to be recognized and paid.

V. It causes an overlapping of methods of proceeding often unnecessary and complicating.

Of the fourth item we have had the past year a full exemplification in the contest in Camden between the County Physician and Coroner. (See "Philadelphia Press," July 22d, 1891.)

Of the fifth, the Kniffin case, 1890, in Trenton, was a good example. Here two juries, the Coroner's jury and the grand jury, were sitting and taking testimony at the same time, and it came to be fully recognized what an unnecessary and expensive addition the Coroner's jury system is.

It must be fully realized that in cases of inquest all that is needed before presentment to the grand jury, is expert medical and expert legal inquiry, for which a proper medical and legal expert are all that is required. The physician should be selected not only because he is a physician and practitioner, but from his special acquaintance with pathology and medico-legal jurisprudence and his ability to make a thorough autopsy. It must be recognized that many excellent practitioners are not versed in the details of ante-mortem or post-mortem appearances. Some of our County Physicians and especially those of our larger cities, have by reason of special study and long experience, illustrated the difference between expert and non-expert medical men. Our present law should be modified, especially in the following particulars:

The office of Coroner and the Coroner's jury should be abolished and the Massachusetts plan substituted.

The County Inquest Physician or Examiner should be appointed by the Presiding Judge of the county, the Law Judge, or the Director of the Board of Freeholders. Where there is no Law Judge the senior Lay Judge can serve in his stead. The body should be in charge of the first physician called, or of an undertaker, until the County Physician arrives. He should be at once telegraphed or sent for.

We thus beg to call the attention of the Legislature to this subject, in order that the interest of life, of justice and of economy may be better conserved.

COMMENTS ON SELECTED DISEASES.

ENTERIC FEVER.

The experience of the year as to enteric and typhoid fever has been serious and widespread. It is not merely that such cities as Jersey City, Newark and Camden have suffered, but we have had reports of a few cases here and there throughout the State. Those who have before studied the relations of continued drought and low ground-water levels to outbreaks of enteric fever, and as often aided and increased by the after sudden rise of ground-water, were prepared to anticipate that we should have an unusual prevalence of the disease. As our vital statistics only extend to July 1st, its chief record will be in the tables of next year. As before, enteric fever seems to find its chief vehicle through lowered wells and rivers used as water-supply. The evidence as to this is constantly accumulating.

Here, for instance, are some more recent facts given by Dr. Brouardel, the distinguished authority of Paris:

"As regards typhoid fever the deaths due to this disease in France amount to 23,000 per annum. Dr. Brouardel gives a great variety of statistics to show that the liability to typhoid is in direct proportion to the imperfections in the water-supply, and that in proportion as a sufficient supply of pure water is provided typhoid abates. Thus, at Vienne the typhoid mortality was 200 per 100,000 while the inhabitants drank surface, hence often polluted, water; but this mortality fell to 10 per 100,000 on a thoroughly good supply being obtained. At Angoulême the introduction of a new supply of pure water reduced the number of cases of typhoid in the proportion of 0.063 to 18. At Amiens, among the military population, the typhoid mortality fell from 111 per 10,000 to 7 when a pure supply of water was secured by artesian wells. At Rennes the inhabitants formerly drank from contaminated wells, with the result that typhoid fever was always endemic. The introduction of pure water reduced the deaths from typhoid among the military population from 43 per

10,000 to 2. Investigations carried out at Besançon, Tours, Carcassonne, Paris and Bordeaux entirely corroborate the above striking figures. Typhoid fever is responsible for the deaths of 1 soldier in 335 in France, or 298 per 100,000, and this in time of peace. In war its ravages are even far greater. Thus the expeditionary corps to Tunis in 1881, consisting of 20,000 men, had 4,500 cases of typhoid, with 844 deaths."

He urges it as the plain duty of Government "to secure the public health against the dangers which arise from using polluted water." We will in another connection discuss how far it is possible that this and other diseases depend first of all upon general lack of cleanliness or the reception of articles into the system, whether as air, food or drink, charged with zymotic particles. The defense against infective particles divide themselves into two classes: First, defense against the most common and ascertained causes, such, for instance, as in typhoid fever, against fæcal excretions and specifically-polluted water-supplies, &c., and, second, against all kinds of filth and uncleanliness, since thus we attack the breeding-places of all infective diseases.

We refer to former recent reports as to some important facts as to typhoid fever. We think it must be admitted that the views of Murchison as to the pathogenic and possible *de novo* origin of this disease, as well as its direct derivation from a special bacillus, are fast gaining ground, especially as in some minds modified by evidence of evolution in forms and in virulency. Also, the variations of type are commanding more attention. Thus, in the past summer the fevers that were rife in Jersey City were often puzzling as between malarial, typho-malarial, typhoid and forms of cesspool or mongrel fever not easily defined. Beside the great studies presented to the practitioners by all this, one thing at least is emphasized, viz , that the scope and duties of Health Boards and skilled Inspectors multiply, and that our greatest hope of prevention and limitation is in cleanliness, house-to-house inspection, isolation, the guarding of water and milk-supply and thorough disinfection.

DIPHTHERIA.

This disease continues to be the great menace of child life, and, more than any other one disease, occasionally ravages whole families or neighborhoods. It will be far more successfully combated when each physician comes to feel that the house and the family in which a case occurs are at once in his charge as much as the particular patient, and require, promptly, sanitary and administrative skill. So, also, there will be great diminution of cases and of mortality when Health Inspectors are prompt and thorough in method, and when parents understand more fully the modes of limitation of the disease.

We have deemed some more recent facts of such importance that recently we have issued a special circular as to it, and distributed it to the physicians of the State. We ask for it the most careful consideration. Particles which transmit diphtheria are conveyed in various ways from the sick-room and by garments, &c., unless close precautions are taken. Its propagation is favored by soil moisture, damp cellars and all mould conditions and by the sudden exposure of masses of decomposable material spread over surfaces. (See recent book of Thorn Thorne, M.D., F.R.S.)

In Montclair and in Chambersburg two families lost several children each from the spreading of cesspool material on garden lawns.

Soyka, of Munich, in an elaborate paper, traces the association of the disease with manure compost or deposits of filth exposed and spread out. Dr. Willoughby presents similar cases. (See report of Epidemiological Society, "London Lancet," May 10th, 1891, and August 8th, 1891.)

Dr. Butterfield and Dr. Thresh confirm these views (British Medical Association, 1891). The handling of strange compounds known as compost and stable manure near Jersey City, and as transported through the State, needs close attention.

It should never be used near dwellings or wells, or left long on car-sidings, but should be plowed under soon after spreading.

Some cases of Dr. Adams, of Maidstone, have been claimed to show that "the diffusion of the infection is often brought about by reason of a rise in the water-level, the soil in which these results take place being one which must also be sufficiently contaminated by soakage of filth to form a suitable breeding-ground for the development and subsequent changes occurring in the pathological organism."

Our defense against it is in clean ground, clean houses, the avoidance of overcrowding, of foul dampness and surface filth, and in the thorough isolation and care of cases, as set forth in Circulars LXXVII. and XLIV. of this Board.

SMALL-POX.

It is very gratifying that for some years past the State has been so far rid of small-pox. The recorded yearly aggregate of deaths for four years past is as follows: 1888, 5; 1889, 3; 1890, 0; 1891, 0. This is in part owing to better attention to vaccination and to more prompt dealing with first cases as they occur. But it has been often noticed that the school age of five years brings many younger children from their homes to new exposures, and for this and perhaps some other causes epidemics seem to occur in cycles.* There is but one thing to do and that is to urge and to secure vaccination, and, in the case of those over fourteen years of age, revaccination. The reasons are fully set forth in our fifth report, and also in subsequent ones, and especially as to revaccination in the twelfth report (1888), pages 27–29.

A French authority recently points out "that while Germany loses only 110 persons per annum from small-pox France actually loses 14,000. He attributes this astounding difference to the rigid way in which vaccination is enforced in Germany, and to the carelessness of his own countrymen in this matter. Statistics show that in 1865, when vaccination was not obligatory in Prussia, the mortality was 27 per 100,000 inhabitants. After vaccination was enforced the mortality fell in 1874 to 3.60 per 100,000, and in 1886 to 0.049. At the present time the mortality from this cause in France is 43 per 100,000."

English and American reports present similar facts. While we have no law of compulsory vaccination, our School law and the Health law of 1887, Chapter LXVIII., Sections 21, 22, 23, give such power to Health and School Boards as make it imperative for them to see that unvaccinated children do not attend public schools and thus expose themselves and the public at large.

We ask that special attention be given to the enforcement of these laws, and that we be not compelled to wait for actual outbreaks of the disease to scare parents into propriety as to the vaccination of children within a few months after birth.

There is no longer any difficulty in securing reliable vaccine lymph if well-known producers are relied upon.

For further details we refer to Circular XLIV. of the Board.

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* Since this was written, this is illustrated in Trenton, Newark, &c.

INFLUENZA.

The great pandemic, influenza, which made such a visitation of almost all the world in 1890, again recurred in 1891 with some important variations. In its course it was as vagrant as before. It visited persons and countries where it prevailed last year, and sometimes, although not generally, affecting the whole population and proving fatal to many. In its symptoms it was quite similar. The description of it in our last report will apply. China and Japan seem to have suffered throughout their immense populations. In England, it is thus noticed by the London "Lancet" so late as May 9th, 1891:

"The outbreak of influenza, which first made its appearance in this country about a month ago, and was for a few weeks confined within a comparatively limited area, has now spread over the whole country. The disease has gained considerable footing in the metropolis, but not to the extent that it did in January of last year.

"The Registrar-General's mortality returns for the week ending May 9th show an increase of 433 deaths in London above the average number in the corresponding week of the last ten years. The deaths primarily attributed to influenza, which had been 10 and 37 in the preceding two weeks, rose to 148, or 21 in excess of the highest weekly number during the 1890 outbreak. The deaths from diseases of the respiratory organs were 584, or 240 in excess of the average; of them, 230 were attributed to pneumonia and 302 to bronchitis.

"Dr. Wightwick, the medical officer of health to St. Olave's district, in a report presented to the Board, stated that, so far as his experience went, the nervous type of the disease, complicated with severe lung symptoms, was more frequent than last year. This is borne out by the exceptional rise in the mortality from bronchitis and pneumonia in the towns which have been most affected. Sheffield still holds an unenviable pre-eminence in this respect, its mortality rate having last week advanced to the extraordinary figure of 70 per 1,000; but we are glad to learn that the virulence of the epidemic is now on the decline in that town. It has now spread to all parts of Yorkshire, but is especially prevalent in the East Riding. There does not appear to be much abatement of it in Leeds and Bradford and the surrounding districts.

"From all parts of Wales accounts have been received of its extension to country districts as well as in the towns.

"So far, then, as compared with the epidemic of 1889-90, its spread has not been so rapid, but it has been none the less sure; and there has been considerable variation in the severity of the type of disease, some districts which furnish many sufferers having a much lower mortality than others. On the whole, however, we fear that there can be little doubt as to its virulence being greater than last year's epidemic, which, contrasted with previous outbreaks was comparatively mild, and was not responsible, either directly or indirectly, for so great a mortality as has occurred in this country during the past few weeks, especially from acute diseases of the respiratory system."

The record of English towns also showed a great increase of mortality, especially for respiratory diseases.

In the United States it was not so widespread as last year. Yet it traveled hither and thither, and in Pittsburgh and Chicago reached a greater prevalence than in the previous year. In New Jersey it caused considerable sickness and increase of mortality, chiefly from respiratory diseases, but not to the same extent as in 1890. In Princeton there were an unusual number of cases, many of them severe. It was reported from various points in the State, especially in March and April. No new facts as to it were elicited. In its source and conduct it is a puzzle more than in its treatment. There is fear that it may become a more frequent visitor than formerly. The great error is that so many think it not necessary to stay within doors until the symptoms have fully subsided. We are constantly hearing of those who, because of undue exposure, have had permanent impairment of some organ.

The most thorough summary as to the disease is to be found in the official report of the Local Government Board of England for 1889–90. As the disease showed no peculiar features as it appeared in the United States, this report is equally of value here. Dr. Parsons, the chief author of this voluminous report, takes strong ground as to its infectivity, and, in the absence of any equally labored presentation of the opposite view, seems to make out his contention. This, too, notwithstanding that the most labored and repeated bacteriological research has failed to find any specific form of microbe or microphyte,* and that the evidence of atmospheric or aërial prevalence, independent of persons and of its outbreak therefrom, has had many illustrations. He regards the contagium to be unstable and having a varying incubatory period of from one to four days.

Taking capillary congestion of the conjunctiva as one of the commonest of the early symptoms, he gives great prominence to the views of Dr. B. Thorne and a few others, that "the conjunctiva is the structure which the infecting material—microbe or not—most generally, if not always, attacks. His contention that the disease tends especially to manifest itself as an infection operating on the central-spinal nerve centers—a view which many share with him—is also put forward." It behooves all physicians to know thoroughly the history and facts as to the disease, since, if it continues to return, it will rank among the most serious of pandemic diseases.

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* It is now claimed that the bacillus has been discovered.

TUBERCULOSIS, PHTHISIS, ETC.

The years 1890 and 1891 have been most remarkable as regards all those diseases which are ranged under the general head of Tuberculosis. In August, 1890, Dr Koch announced that he had discovered a remedy capable of curing a large number of cases of this disease in various forms. The high scientific reputation of Koch, the apparent support given to his views by those of high distinction in medicine, and the wonderful pilgrimage to Berlin by physicians, reporters and patients from many lands, gave to the remedy a kind of consideration quite new in the annals of modern medicine. It seemed to matter little that the medicament was a secret one, and that when its composition was announced it was not really a revealing of its constituency. It was not until Virchow, from the standpoint of a pathologist, grappled with the facts in evidence as to the results that some moderation was given to the unwonted enthusiasm, and that the profession fell back into those lines of patient inquiry, and those methods of testing alleged biological discoveries which are more in accord with the true laws of science and the testimonies of applied art.

It must be said of tuberculin, that while it is still subject to experimentation, and may have some possible and hopeful relation to some forms of tuberculosis, it has not proven to be an agent of value in the treatment of phthisis pulmonalis or any known form of bacillary consumption. Amid the hundreds of trials and testimonies we select that of the Brompton Hospital for Consumptives, as given by C. Theodore Williams, M.D., the senior physician to the hospital, in a lecture in June last:

"Koch's treatment of phthisis has been selected partly because a considerable number of cases have been for some time under this treatment in the hospital, and some estimate may therefore be formed of its specific action in consumption, and partly because it is a subject which lends itself specially to clinical demonstration; and, as the ten cases under my charge have been carefully recorded with a view of testing the method, you will be able, after examining the patients, to form your own judgment on the matter. Moreover, a visit to Berlin last December enabled me to investigate a large number of cases under the Koch treatment in the German hospitals, and especially those in which it had been carried out under the personal supervision of Professor Koch himself, and to take note of any necessary hints or precautions. In his further communication Professor Koch informs us that tuberculin is a glycerine extract of pure cultivation of tubercle bacilli in which the parasites have been killed. His general conclusions may thus be summed up: 1. That the hypodermic injection of tuberculin in tuberculous patients is followed in a few hours by a reaction, characterized by rigors, fever, pain in limbs, languor and great fatigue, often vomiting, increase of cough and expectoration, and occasionally by an eruption like measles, the reaction lasting from twelve to fifteen hours, and the patient returning at the close of it to his ordinary state. 2. That the tuberculin penetrates to, and causes necrosis of, the tubercular tissue wherever situated in the body, but does not necessarily destroy the tubercle bacilli themselves, and that its penetrative action is extremely valuable for diagnostic purposes, but that it has no effect on necrotic cheesy masses. 3. That patients in the first stage of phthisis, after being under treatment for from four to six weeks, were free from every symptom of disease, and might be pronounced cured. 4. That patients with cavities not too highly developed improved rapidly and were almost cured. 5. That only in those whose lungs contained many large cavities could no improvement be found objectively, but even in these the expectoration diminished, and there was subjective improvement. Professor Koch concludes that he is led to suppose that phthisis in the beginning can be cured with certainty by this remedy, though he admits that the cure cannot be considered lasting until longer time has elapsed. The clinical evidence as to the action of Koch's remedy in phthisis has been abundant. Professors Gerhardt, Leyden, Senator and Ewald have spoken, but not on the whole favorably—nay, in many cases the reverse; but the most important evidence which has as yet been furnished is the pathological, supplied in sundry and valuable communications of Professor Virchow, the greatest living pathologist, who examined sixteen phthisical patients who had died at the Charité Hospital whilst undergoing the Koch treatment. The results appear to be: (1) colossal hyperæmia of the pia mater and brain substance, with tubercular meningitis, in a boy aged two years and nine months, after four injections; (2) intense reddening of the granular layers on the surface of old phthisical cavities and swelling of lymphatic glands; (3) caseous pneumonia, induced, as appeared in five out of sixteen necropsies, in one case after six injections; (4) a characteristic form of catarrhal pneumonia in seven cases, termed by Virchow 'injection catarrhal pneumonia;' (5) eruption of miliary tubercles. He also noted that there was no necrosis of individual tubercles throughout the body, but they generally remained *unaffected*."

After giving, with clinical accuracy, the details of all the cases, he thus presents the results:

"Let us now summarize the results of the treatment in these fourteen patients. We must bear in mind that five were first-stage or tuberculization cases; in one softening had commenced, and the rest were patients with cavities, five with single cavities and three with double cavities, though of limited extent.

"*General condition.*—Six improved, of whom three improved greatly, seven deteriorated, and one remained in a stationary condition.

"Of twelve patients whose weights were recorded, four gained in weight (the greatest gain being ten pounds), five lost and three were stationary. Loss of weight is almost invariable if there is much reaction, and we must bear in mind that all these patients reacted at one period or another of the treatment.

"*Influence on pulse, respiration and temperature.*—As a rule, during a reaction there was a simultaneous rise of pulse, respiration and temperature, and a corresponding fall to the normal at the close of it, but this was not invariable, for in some of the slighter reactions there was a rise of pulse and respiration, accompanied by headache and languor, without any elevation of temperature. In the pyrexial cases, such as case 6, and in two of the private patients, the effect of the tuberculin was to intensify the pyrexia, raising the temperature by several degrees. In some of these cases, where fresh tubercular and pneumonic changes followed the injections, the pyrexia remained more or less persistent for weeks. Where, however, extensive excavation took place, there was a tendency to subsidence of fever. The patients described as improved all stated that they could breathe more easily after the treatment. The remedy seemed to have no permanent effect on pulse-rate or respiration-rate.

"*Digestive organs.*—The patients, as a rule, lost appetite, and in two cases diarrhœa came on, but there was no suspicion of its being due to intestinal ulceration.

"*Skin and kidneys.*—No special effect was noticed on the kidneys, although some observers have noted the presence of albumen in the urine after injections. In two patients affected with night sweats these occurred during the reactions.

"*Blood.*—The blood was carefully examined in two patients during the reaction for tubercle bacilli, but with negative result.

"*Cough and expectoration.*—Cough, as a rule, increased after the first injections, and occasionally there was slight aphonia; after a while cough diminished, unless the lung condition showed advance of the disease. Expectoration invariably increased in quantity, in some cases threefold, was generally purulent, and contained often caseous material visible to the naked eye. In the hospital the sputum was examined for tubercle bacilli by our able assistant medical officer, Dr. Allden, before the treatment commenced, and examinations were carried on every other day during its continuance. All observers of any experience have come to the conclusion that no great stress can be laid on the variations in the number of tubercle bacilli in the sputum, and that they are often dependent simply on the quantity of expectoration; so that their increase does not always mean increase of disease, especially where cavities exist, nor does their diminution mean arrest of disease.

"Professor Koch lays great stress on their diminution under the treatment, stating that it takes place when the expectoration begins to present a mucous appearance. Out of thirteen cases in which they were detected they diminished in one case, increased at first and diminished afterwards in two cases, remained abundant throughout in four, and increased in six. In many cases the injections appear to be immediately followed by increase in the number of tubercle bacillus.

"*Lung tissue.*—The appearance of lung tissue in the sputum seemed to be the most direct result of the injections. It was found in all but one case at some time or other of the treatment, and generally after the first few injections. In the favorable cases it disappeared later, but in the unfavorable cases it was detected throughout the treatment. It was generally abundant, and presented not only the hooklets, but often almost complete sections of pulmonary alveoli. It is a curious feature in the clinical records of the Berlin consumption cases under the Koch treatment in the hospitals, that, while the observations on the numbers of tubercle bacilli are most carefully recorded, little or no mention is made of the presence or absence of lung tissue in the sputum, assuredly a most important item in determining the progress of lung change.

"*State of the lung as evidenced by physical signs.*—Among the five tuberculization cases, cavities formed in four, and in three extension of tuberculization took place. In the case of softening, a cavity formed rapidly, apparently with great relief to the patient. In the other eight the old cavities either extended or fresh cavities formed, in many cases in regions not commonly the seat of cavities, such as the right middle lobe. The conversion of an apical tubercular mass into a cavity was generally a rapid process, taking place often in three or four weeks, as in cases 1 and 4 and the third private case. The formation of secondary cavities was also rapid, as occurred in the first and second of the private patients. The extension of old cavities was well marked in two cases. With regard, therefore, to excavation, we must bear in mind that it either took place, or extended, in no less than thirteen out of fourteen cases. In three of the patients contraction of the cavities was noted to be proceeding at the time of our last record, even though extension had originally taken place. As to spread of tuberculization, it took place in six cases, and generally proceeded by continuity, but in two cases infection of the lower lobe appears to have commenced by re-inhalation of cavity secretion. In one case there was tubercular spread without excavation.

"*Larynx.*—Three of the patients had tuberculosis of the larynx, but curiously the lesions appear to have been unaffected by the injections.

"And now it will be seen that the evidence of the cases narrated does not confirm Professor Koch's conclusion, but like those of Professor Virchow, Ewald, and Dr. C. J. Nixon,* they point out some of the difficulties and dangers of the treatment. There is no doubt about the penetrative action of tuberculin, and, possibly, if something were combined with it, this remarkable power of selecting tubercle might be turned to account; as it stands at present in phthisis, its effect is to convert tuberculous masses, which may be perfectly quiescent, into cavities, and the process is by no means always a safe one. As regards the condition of our patients after treatment, all we can say is that they fared worse than the ordinary run of similar consumptives, and, moreover, that several of them improved considerably when transferred from Koch's system to the ordinary treatment of the hospital. There may be, and, indeed, there are, cases of phthisis in which the promotion of excavation is desirable, and for such the Koch method is indicated; but they are, I take it, exceedingly rare, and for the great mass of consumptive patients it is certainly not indicated. I close this lecture by the following conclusions: (1) Professor Koch's fluid has a strong affinity for tubercular material, which it appears to penetrate, and to produce inflammatory changes in and around all parts of the body; (2) that the changes in the lung set up seem to be partly necrotic—*i. e.* destruction of tissue—but partly infective, producing fresh tubercles; (3) that the effect on tubercular consolidations is to cause their softening and excavation, and subsequent removal by expectoration or absorption; that this process of elimination of tubercle by excavation leads to extensive destruction of lung tissue and to the formation of a large number of cavities in lungs formerly the seat of quiescent tubercle, which may give rise to septic infection; (4) that this process is also at times accompanied by fresh tuberculosis in the neighborhood, either by infection of fresh tracts through tubercle bacilli passing down the bronchi, or by their penetrating into neighboring alveoli; (5) that, on the other hand, the removal of the tubercular masses by excavation is occasionally followed by fibrotic changes in the lung, which cause contraction of the cavities thus formed, and in this way conduce to arrest of the disease, but that such favorable changes cannot be predicted beforehand; (6) that there is no proof of the possibility of the cure of phthisis by this method within the periods mentioned by Professor Koch, and that, as at present administered, its results are less favorable than those of the ordinary methods in use."

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* Dublin Journal of Medical Sciences, March, 1891.

There are important lessons, however, which have been taught amid what was at first the wildness of experimental haste. First—

(*a*) When we generalize by associating various allied neoplasms under one name, we need to be careful to know that similarity is not such absolute identity as to make it safe to predicate on it some one treatment and look for identical results. In botany we have families, classes, orders, genera, species, and so there is need for very accurate classification even if we establish the family as the same. For instance, tuberculosis which shows itself in the general form known as scrofula, or in marasmus, or hydrocephalus, or in a joint, on in phthisis pulmonalis, needs to have its type and locality recognized in treatment.

Lupus affords an important example. At the very time that so much of the alleged success at Berlin centered around lupus, Prof. Jonathan Hutchinson, of London, from his standpoint as a surgeon, and from no zeal to combat views just announced, was casting grave doubt upon the question whether lupus is at all tuberculous or a bacillary disease, since in some of its most pathognomonic forms the appearance of the bacillus is after the disease has shown its specific character. Prof. Gibbs and E. L. Shirley, M.D. ("American Medical Journal of Sciences," see "Medical News," December 27th, 1890), like many others, claim "that tuberculosis and phthisis pulmonalis are different disease processes, resting upon distinct pathological and clinical bases."

(*b*) The use of tuberculin has given great prominence to the whole subject of hypodermic medication. Great as is the value and power of this mode of reaching the system rapidly, it is ever to be regarded as furnishing great possibilities for the most serious results. There is no doubt that numbers were killed by tuberculin, as they have been by other substances used for hypodermic medication. This is not against the wise and skillful use of hypodermic method which, indeed, is so promising in various diseases that it must not be trifled with. But the great need of caution must be emphasized.

(c) Attention needs to be given to the varieties of hypodermic injections for the purpose of curing tuberculosis which have been and which are likely to be proposed. Dr. J. Russel, of Paris, has long claimed great results from an effort to render the body antiseptic through the use of eucalyptol and other antiseptics. Cases have frequently been brought before the Society of Practical Medicine of Paris, to show their success, and also during the Medical Congress at Berlin, 1890, Dr. Russell showed the treatment on many patients at the Charité Hospital. Liebreich seems to have had good results from the injection of the cantharidate of potash. M. Lannelongue's use of the chloride of zinc is based on the fact that in small quantities (two or three drops of a ten per cent. solution) it excites such sclerotic processes as help to secure that fibrous induration which is thought to be a natural curative process for tuberculosis.

This method has been shown before the Paris Academy of Medicine and at the recent congress for the study of tuberculosis (Paris, July, 1891), and is attracting much attention. Prof. Gibbs, of Michigan, and Dr. Shirley seem to have used pure iodine and chloride of gold with advantage. I. Blake White, of New York City, values chloride of gold and iodide of manganese. At the last meeting of the American Medical Association, Prof. Vaughan said he had made injections of filtered bacterial product in no way connected with tuberculosis (bacteria of water) in healthy persons and consumptives. In the former it increased the temperature gradually up to between 100 and 101; in the tubercular cases about the same amount. The latter said they were improved. He had employed tuberculin in eight cases without apparent benefit ("Medical Record," May 16th, 1891). Bloood serum, especially dogs' serum (Baretta, Paris; Prof. Richet, &c.) has come in also for its share of use, and just now there are important discussions as to the agency of blood serum in destroying micro-organisms. Some claim, however, that this only represents the leucocytes, which Sir Joseph Lister describes as "the scavenger cells or phagocytes discovered by Metchnikoff; the white blood corpuscles which envelop parasitic intruders and render them harmless." The two doctrines, however, are really distinct.

(*d*) Our experience with tuberculosis has emphasized the importance of not relying too much on statistics if they are chiefly generalizations. For instance, it is stated that one-ninth of all deaths occur from tuberculosis. We need very much to know just what diseases are classified in the enumeration. Then as to age, distribution, locality of disease and history. Phthisis pulmonalis needs very accurate classification by itself, because of the claimed relation of dried sputa to it as distinct from other tubercular disease. Here age distribution is of great importance, since the phthisis of small children differs much from that of adults. Chronic bronchitis and many other lung affections are often loosely classified with bacillary consumption. Not very long since statements were common that very many post-mortem examinations showed recoveries from pulmonary phthisis. Much doubt has recently been thrown upon the pathological accuracy of such statements. The trials of tuberculin show that there is need of more rigid classification of the different varieties of cases. Virchow regards it as acting in a selective way upon tuberculous tissue, but its diagnostic value is limited by the fact that it leads to rapid necrosis, with inflammatory hypermæia and exudation.

(*e*) Some important practical lessons have been taught as to the management of cases of pulmonary consumption. It is significant that Dr. Koch did not base his mode of treatment upon any germicidal methods; his own language is, "the remedy does not kill the tubercle bacilli, but the tuberculous tissue." While inhalation is still used somewhat for local antisepsis or the quieting of cough, we no longer expect to kill bacilli thereby.

(*f*) Our hopes now are more forcibly than ever shown to be in the following lines: Such attention to general vigor and such special methods for increasing lung capacity in those showing lack, as will secure normal power in young life; such regard to *alimentation* and to all habits of self-control as will secure full nutrition to the body both for growth and for the exercise of force; such early diagnosis and such accurate attention to any signs of pulmonary disability as will secure the best advantages of health. There are those who from the first should be enjoined to seek an open-air life and occupation, or who should resort to it at the very first symptoms of pulmonary disease.

"Out of towns and out of crowds," says Dr. Latham, is the first great rule. There can be no doubt that the ravages of consumption can be greatly checked if only prevention is studied as primary. While change of air and resort to "enchanting distances" may be desirable, there must be the most careful study of what can be done in the home or by changes of locality and elevation in easy reach.

BOVINE TUBERCULOSIS.

The relation of bovine and human tuberculosis to each other has long been recognized as of very great importance. Long before Koch discovered the bacillus tuberculosis, Villimaii (1866) declared the close relation existing between them, and was followed by Cheveau, Gerlach and others in the claim that the disease is communicable. The subject was alluded to from time to time in the reports of this Board (1881, &c.), was especially noted and described in the circular of 1884, and was in part the subject of an article (Twelfth Report, 1888, pp. 37–40), on the relation of human and animal diseases. In 1890 the Secretary presented the subject quite fully to the State Board of Agriculture in the yearly report required of him as to contagious diseases of animals. We quote briefly from this report as follows:

"Its relations to human tuberculosis are now pretty definitely stated by high authorities, yet not without some opposition of belief. With some difference in size and behavior, it is now agreed by biologists that the bacilli of human and bovine tuberculosis are identical. Even those who are not fully satisfied as to the causative relation of the bacilli to consumption in man and animals, admit the diagnostic value of the bacilli, and agree that in man or beast they are indicative of the presence of tuberculosis. No case of its transfer to a human being through the sputa of cattle is authenticated. It, therefore, thus far is not shown to be communicable to the human being through the breath or sputa or secretions of animals.

"This brings us to another question which agitates the medical and veterinary world, and which has led to the appointment of an investigating commission in Great Britain. What are its effects on the milk and the flesh of animals in which it is found?

"This is equivalent to the question, Can the disease be communicated to human beings through the milk or the flesh of animals? Here again we have some differences of opinion among high authorities. These divide into five sections.

"The first, which is very small, claims it cannot be communicated.

"The second claims it is only communicated through milk when tuberculous disease is found in the udder.

"The third claims that, if tubercle exists in any part of the animal, the milk is unfit for use.

"The fourth claims that, if the tuberculous deposit is found in a part, that part is unfit for human food and should be rejected.

"The fifth claims that not only should the part itself be rejected, but the whole carcass, since tuberculosis is generally a constitutional disease and as such may affect the whole body, although no bacilli have been discovered in the muscles. The best-sustained view is the second, viz., that milk should not be used when the disease is in the udder. However, the view that the milk of all cows that have tubercular lesions in any part of the system should be rejected, is rapidly gaining ground.

"In 1888 there was a General Congress on Tuberculosis in Paris, made up of veterinarians and medical men. It numbered about 300 members and included several distinguished veterinary authorities and three or four medical men who had experience in animal disease. The action of that congress was in favor of the view that neither the milk nor flesh of tubercular animals is fit for human food, that from it there is danger of the direct transfer of tubercular disease, or consumption, and that both milk and meat require inspection. If the milk is used boiled, and if all meat eaten has been subjected to a temperature of 212°, it is claimed that it is safe. About the same time an English Privy Council Commission was appointed, which has taken abundant testimony and concluded in favor of the communicability of the disease. There has also been a very important trial in Glasgow (1889), in which many distinguished authorities were examined as to the condemnation of two carcasses, one of which showed no signs of disease whatever in the flesh, but only in the abdominal cavity and lungs. The decision of the court in both cases was that the carcasses were not salable."

Since then a Congress of Tuberculosis, Paris, 1891, has confirmed these views. A Royal English Commission, which has not yet reported, is investigating the subject. The importance attached to it was signified by a special section as to comparative study of animal diseases, at the International Congress of Hygiene, in London, August, 1890.

Prof. Burden Sanderson, in opening a paper said there are several points which may be accepted as facts, such as the existence of the tubercle bacillus, the identity of bovine and human tuberculosis and the existence of danger in the use of tuberculous meat. Chevaeu and Baumgarten were the first to draw attention to the danger of eating tuberculous meat. We still are in want of more experimental research.

Tubercle should be included in the Infectious Disease Prevention act. We still want information as to the actual presence of tubercle. About 5 per 1,000 cattle are generally condemned as tuberculous. Prof. Bang, of Copenhagen, in an able paper, said he did not think the milk of a tuberculous cow, with udder apparently healthy, is in a great majority of cases dangerous, though it undoubtedly is sometimes, and is always suspicious. At the Berlin Congress (1890) he also contradicted the views of Bollinger (Munich). Out of 28 cows 2 were found with bacilli, although the uddders appeared healthy. In another set of experiments four were found virulent, but in three of these careful examination showed nodules in the udder.

As to meat, Prof. Bang thinks the "experiments by others show that the muscular tissue is so unfavorable a nidus for the tubercle bacilli that they do not multiply in it."

"So long as the tuberculosis is strictly localized the meat is not a source of danger." Prof. McFadyean and G. Sims Woodhead gave instances from personal observation of tuberculous masses in the buttocks of tuberculous cattle, in one case there being only a few nodules in the lung. They are a possible, though perhaps a comparatively rare source of danger; "a résumé of our own and previous experiments indicate that this source of danger is not frequently present, but it may exist in a certain proportion of cases."

As to the danger from milk the view was more pronounced.

Although tuberculous mammitis is readily diagnosticated in advanced cases, it is very obscure in its earlier stages. He claimed that the main cause of tuberculosis was from animals. It was claimed that spontaneous tubercle never occurs in the pig, and tubercle in no form in the sheep. The general sentiment in the long and able addresses was that all dairies should be inspected, that milk was not very rarely a conveyancer of tuberculous disease, and that the meat was often suspicious, although the time had not yet come for rigid condemnation of all parts of carcasses where only localized tubercle could be found. Prof. Crookshank read a paper showing the frequent confusion of actinomycosis or the ray-fungus disease with tuberculosis, and showed specimens and photographs exhibiting the difficulty of diagnosis. So vast are the relations between animal and human diseases, and so critical are all facts bearing on the spread of tuberculosis, that we commend the subject more fully to the interest of physicians, sanitarians and officers of health.

LOCAL EXPERIENCE.

It has been our duty to see the disease from time to time in this State, and to be present at post-mortem examinations where it was necessary to secure accurate diagnosis. It has chiefly been found in two classes of dairies—those in which cattle were kept in city stables under forced and unnatural conditions of filth, overcrowding and excessive food, especially of beer grains, and those in which registered or grade cattle were kept in most excellent condition, generally in cows with little allowance for pasture or exercise, and fed so as to produce the largest quantity or the best quality of milk.

In each case the disease was associated with unnatural conditions. The outbreak could generally be traced to one or two animals, and it seemed more generally to extend to those in adjoining stalls. We have had no direct evidence of ill effects from the milk or the meat of the diseased animals, although generally the use of the milk has been discontinued. The disease has generally shown itself mostly in bunches along the peritoneum and in the lungs. We have never seen evidence of its presence in muscle, although a very few cases are recorded. The udder is by no means uniformly affected.

While the milk or meat of any animal suffering with chronic disease is not to be regarded as equal in quality with that of well and well-fatted animals, it is still premature to assert that the meat of any animal having any sign of tuberculous deposit in any part of the body is so unfit for use as to be prohibited. Those who are disposed to maintain the gravity of the risk insist that all such meats and milk shall be condemned, or that they only be sold and used under such conditions as will secure the most thorough cooking or boiling. Others contend that the risk must be more closely defined, and that at present we can only assert dangers when there is evidence of tubercular deposit in the udder.

Health authorities and many physicians are so throwing their influence on the side of safety as to claim at least the boiling of all milk, unless its source is thoroughly known.

This is universal in Germany, but as boiled milk is somewhat injured in its nutritive qualities by boiling, and greatly changed in taste, our American people do not incline to the substitution. We add the following as to boiled or sterilized milk :

"*The Nutritive Value of Boiled Milk.*—That the sterilization of milk, however important, is not without its disadvantages, has been shown by Randnitz and others ('Medical News,' November 30th, 1889). To determine the comparative assimilability of proteids and fats from boiled and non-boiled milk, Dr. Evsevy V. Vasilieff, of St. Petersburg ('St. Petersburg Inaugural Dissertation,' 1889, No. 33, p. 35), has undertaken a course of most careful experiments on six healthy young men, aged from eighteen to twenty-three years. Each experiment lasted six days, during three of which the men received raw milk, and during the other three boiled milk, the daily amount of the article in either case varying between 1,850 and 4,200 cubic centimeters. The following are the conclusions deduced by the author from his very instructive researches:

"1. The assimilation of nitrogenous ingredients from boiled milk is invariably less than that from the raw article. In the case of raw milk the average percentage of non-assimilated nitrogen amounts only to 7.05, the maximum to 7.62 and the minimum to 6.42; while in the case of boiled milk the respective figures are 8.18, 8.79, 7.76.

"2. The same holds true with regard to the assimilation of fats. When fat is ingested in a raw state the average percentage of non-assimilated fatty acids is 3.89, the maximum 4.85 and the minimum 2.88. In the case of boiled milk, however, the figures rise to 6.01, 6.99 and 4.53 respectively.

"3. Boiling seems to affect especially the assimilation of the fats of milk, since the percentage of fatty acids in relation to the total quantity of dried fæces in those fed on boiled milk is considerably larger than in those fed on non-boiled milk. In the former case, fatty acids constitute 19.03 per cent. of the total amount of dry fæces; but in the latter, not more than 16.81. In other words, when a person ingests his milk boiled, every 100 grammes of his dry fæces contain a surplus of fats amounting to 2.22 grammes.

"4. Therefore, as regards its nutritiousness, boiled milk represents a decidedly inferior dietetic article, compared with raw milk.

"5. As far as proteids are concerned, the difference in their assimilation may find some explanation in Dr. I. Schmidt's researches ('Moscow Inaugural Dissertation,' 1882), according to which, under the influence of boiling, cow's milk undergoes important chemical changes, nearly all the albumen and a part of the casein being transformed into hemialbumose. Schmidt's analysis proves that raw cow's milk contains 8.55 per cent. of casein, 8.4 of albumen and 6.1 of hemialbumose. Under the influence of ten minutes' boiling, the proportion of casein sinks to 7.59 per cent., that of albumen to 0.7, while that of hemialbumose rises to 23.4. ('Provincial Medical Journal,' January, 1890.)"

Another writer says:

"The effect of heat is to thicken the milk and intensify its colloidal (ropy or mucilaginous) character.

"The casein is not coagulated by the heat, but is less readily coagulated by rennet, and yields slowly and imperfectly to the action of pepsin and pancreatin.

"The fat-globules themselves are somewhat affected by the heat, and after standing lumps of butter-fat have sometimes been observed on the surface of the milk. But the coagulated proteid matters attach themselves to the fat-globules and probably have an influence in bringing about that less perfect assimilation of fat which has been noted by various observers as true of infants nourished upon sterilized milk.

"The milk-sugar by long-continued heating is completely destroyed, and is probably affected to a certain extent during the interval ordinarily allowed for sterilization.

"Finally, sterilized milk is less readily and less perfectly digestible than raw milk, and if sterile milk is sought for, the present desideratum is to obtain it either directly from the animal, or by a process not accompanied by such serious drawbacks.

"Such a process is believed to be the heating of the milk, after being rendered feebly alkaline with lime-water, to 155° F. for six minutes; or, still better, the treatment in alkaline solution with pancreatin at 155°, followed. if not used immediately, by momentary heating to the boiling point." (See "New York Medical Record," July, 1891.)

With the present status of facts in evidence we commend the whole subject of bovine tuberculosis to the inquiry of all physicians and especially urge the closest supervision of meat and milk-supply. Also, that sick children, or persons generally needing especial fluid nourishment, should be careful as to their source of milk supply.

During the past summer the attention of the Board was called to a number of sick animals in an excellent, well-kept herd of thirteen cattle, in Sussex county. The disease had begun with the cough and sickness of a single cow about two years since. There is disagreement as to whether a cow brought into the herd at that time, by purchase, had already signs of disease, although the first one to show it severely was one of the cattle raised on the farm. The disease proved to be tuberculosis, both in acute and chronic forms, and it became necessary to destroy ten of the cattle.

All such cases are of vital interest both to the profession and the public, and so we here subjoin the report of Professor H. F. Formad, of Philadelphia, on some specimens submitted to him for biological examination:

EXAMINATION OF MILK AND VISCERA FROM CASES OF TUBERCULOUS CATTLE.

REPORT MADE TO THE STATE BOARD OF HEALTH AND THE DAIRY COMMISSIONER OF NEW JERSEY BY DR. H. F. FORMAD.

UNIVERSITY OF PENNSYLVANIA,
PATHOLOGICAL DEP'T,
PHILADELPHIA, Aug. 1st, 1891.

GENTLEMEN—I beg leave to give the results of my examinations of the specimens from three tuberculous cows and one calf, the specimens being certain viscera, including the udder, and various samples of milk from the same cattle.

The viscera examined were sent to me on June 24th and on July 11th, while the specimens of milk were received on June 11th and during the early part of July, said to have been taken from the same cattle.

SPECIMENS RECEIVED JUNE 24TH, 1891.

I. *Specimens from tuberculous cow.*

A. *Lung* shows fully-developed tuberculosis with caseation, and microscope revealed numerous tubercle bacilli. Bronchial lymph-glands swollen and showing cheesy necrosis and tubercle bacilli.

B. *Udder* from the same cow carefully examined microscopically, but no trace of tuberculosis or bacilli found.

C. *The milk* from this cow was submitted to careful tests, such as will be detailed below, but no tubercle bacilli were discovered.

D. *Lungs from calf* carried by this cow for eight months. Microscopical examination failed to reveal any trace of tuberculosis. The lung-structure was perfectly crepitant and without any foci of hepatization or any enlargement of bronchial glands. Tubercle bacilli absent.

SPECIMENS RECEIVED JULY 11TH.

II. *Specimens from tuberculous cow sick two years.*

A. *Lung* shows the advanced tuberculous affection with caseous degeneration; tubercle bacilli in abundance. The masses in the costal pleura (which accompanied this specimen) are also tubercular, but show only few tubercle bacilli, and but slight cheesy change.

B. *Udder* is perfectly normal. Careful microscopical examination of all parts of the piece received did not show any tubercle bacilli and no tubercle granulations. Portions of the tissue were submitted to culture methods, but these failed to reveal bacilli, as well as the staining methods.

C. *The milk* from this cow failed also to show tubercle bacilli, both on staining and culture methods. The milk appeared to be of good quality.

III. *Specimens from tubercular cow sick two months.*

A. *Lung* shows one well-developed tubercular mass and numerous smaller foci, all containing tubercle bacilli in limited number.

B. *The udder* is perfectly normal and free from tubercular lesions. No trace of bacilli found in microscopical section properly stained nor upon culture.

C. *The milk* from same cow (sample in blue bottle) is absolutely free from bacilli; it seems, however, to be of poor quality, being watery and poor in fat.

SUMMARY.

Collectively the results of the examination of all the samples of milk (of which seven were examined), and of the viscera from tuberculous cattle, sent to me, may be summed up as follows:

1. *Milk.*—Not one of the specimens so far examined showed any trace of the tubercle bacillus, and with two exceptions the milk appeared to be of excellent quality.
2. *The udders* in each case were normal and showed no trace of tuberculization.
3. *The lungs* in each instance (save from the lung of the calf carried eight months) showed typical bovine tuberculosis (pearl disease).
4. *The bronchial* lymph-glands of the adult cattle examined showed, as well as the lungs, tuberculosis and tubercle bacilli.

REMARKS.

These observations, as far as they went, revealed facts that are absolutely conclusive. The examination was conducted with all means known to science, and I was assisted in the work by my brother, Robert Formad, V.M.D., of the Veterinary Department of the University. Special attention was paid to the milk and udders of the cattle. After failing to find tubercle bacilli (the milk and udder) by microscopic and staining methods, we resorted to culture experiments by the glycerine-agar, and by Koch's blood-serum method, as well as by Woodhead's method. We also inoculated twelve guinea pigs into the anterior chamber of the eye with each of the samples of milk, and one with each of the three specimens of udder under examination. After watching the experiments of from three to eight weeks' duration, we found that nothing developed which in the least would indicate the presence of tubercle bacilli.

We think it now safe to conclude, from the experiments as far as carried out, that neither the milk nor the udder in the three tuberculous cattle examined showed any trace of tubercle bacilli.

COMMENTS.

In my experience the udder is rarely affected, even in fully-developed internal tuberculosis of cattle. I have found tubercle bacilli (in cases *other than those referred to above*) once in fifty cases, in both milk and udder of tuberculous cattle. In the meat I never found bacilli, even in highly-tuberculized cattle.

I am fully convinced that the dangers from the use of milk from cows affected by tuberculosis are much overdrawn, notwithstanding the contrary statements of some good authorities. Opinions among scientists on this subject are much divided, as is well known.

The tubercle bacilli being the established poison of tuberculosis, the observations in the three cases above recorded conclusively prove that in spite of tuberculosis of internal organs the milk was not contaminated. The reason for this is, I think, that the udders were normal. I think that only when the udder is tubercular (which fact could be easily established in the living animal by examining the udder and its surroundings for enlarged lymph-glands), there would be risk from the milk.

Naturally the milk from tuberculous animals must be of inferior quality. It is probably less nourishing, less rich in fat, and hence is an imperfect and improper article of food, and in this way the milk is harmful. I would recommend that a few more observations be made.

Respectfully,

HENRY F. FORMAD, M.D.

CLIMATOLOGY.

In order to afford data by which variation in diseases may be compared with variations in climate, the reports of this Board give various climatological records in localities chosen as representative. In such a plan it is not needful to survey all the scope of the meteorologist, who studies the science which treats of the atmosphere and its phenomena, but rather to deal with climate and causes which modify it in a particular place, or with weather as denoting different degrees of temperature, humidity, winds, cloudiness, rains, snows. While various facts appear in all the reports, attention is particularly called to the division "Climatology," in the fifth report, and to the article on "Comparative Facts in Climatology and Geology," in the sixth report, pages 269–284. It is to be remembered that climate is not the mere expression of atmospheric condition, but has to do with distance from the equator, elevation, the distance from the sea or large bodies of water, prevailing winds, the character and contour of the geological structure and of the soil, the natural or artificial drainage, the amount of forests, the cultivation of the soil, the access of light and heat, &c.

Under the recent law, and because of decided improvements in methods and in instruments of precision, we have reason to hope that these records will ere long be more informatory as to the relations between climate and health.

STATION, BEVERLY, BURLINGTON COUNTY, N. J.

Latitude, 44° 4′ N.; Longitude, 74° 55′ W. Height of Barometer Cistern above Sea Level, 40 feet.

Observer, C. F. Richardson.

	Barometer. Reduced to 32°.			Thermometer.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	....	....	....	100	39	73.1	78.2	S.	4.92	....	11	7
August	....	....	....	99	45	72.6	83.4	N. W.	5.60	....	12	5
September	....	....	....	88	41	66.0	85.3	W.	3.97	....	10	11
October	....	....	....	81	28	55.0	84.0	N. W.	6.50	....	16	13
November	....	....	....	74	19	40.2	75.2	W.	1.07	....	6	4
December	....	....	....	53	8	30.8	80.3	N. W.	3.40	....	11	9
1891.												
January	....	....	....	56	15	34.6	83.1	N.	6.23	....	11	8
February	....	....	....	70	10	38.8	81.7	N. W.	5.10	....	15	13
March	....	....	....	64	11	36.8	77.9	N. E.	5.87	....	14	14
April	....	....	....	84	24	53.9	70.8	N. W.	2.12	....	9	5
May	....	....	....	91	31	60.3	72.0	W.	2.20	....	10	10
June	....	....	....	97	43	70.6	75.9	S.	5.81	....	7	6
For the year.	....	....	....	100	8	52.8	78.9	N. W.	52.80	....	132	105

* Including melted snow.

OF THE SEASONS.

	Temperature.	Precipitation.
Spring	50.1	10.20
Summer	72.1	16.33
Autumn	53.7	11.54
Winter	34.7	14.73

STATION, PATERSON, PASSAIC COUNTY, N. J.

Latitude, 40° 55′ N.; Longitude, 74° 11′ W. Height of Barometer Cistern above Sea Level, 142 feet.

OBSERVER, J. H. BOLTON.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (Inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July												
August												
September												
October												
November												
December												
1891.												
January												
February				65	11				4.21		12	
March				68	10	39.6			2.05		7	
April				85	22	53.6			3.10		10	
May				88	31	57.3			3.76		9	
June				96	46	68.8						
For the year.												

* Including melted snow.

STATION, NEWARK, ESSEX COUNTY, N. J.

Latitude, 40° 29′ N.; Longitude, 74° 27′ W. Height of Barometer Cistern above Sea Level, 35 feet.

OBSERVER, F. W. RICORD.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	30.28	29.76	30.06	94	65	73.0	....	S. E.	5.40	———	8	——
August	30.22	29.69	30.01	88	50	72.0	....	S. E.	5.20	———	15	——
September	30.33	29.81	30.11	84	46	65.0	....	S. W.	5.13	———	12	——
October	30.31	29.35	29.88	72	32	54.0	....	N. E.	6.49	———	14	——
November	30.35	29.62	30.06	60	17	43.0	....	N. W.	0.78	———	8	——
December	30.53	29.470	30.06	48	13	30.0	....	N. W.	3.71	1	9	——
1891.												
January	30.51	29.06	30.08	50	16	33.0	....	N. W.	8.71	———	12	——
February	30.71	29.40	30.09	60	12	36.0	....	N. W.	4.67	4	16	——
March	30.57	29.48	30.11	58	10	36.0	....	N. E.	4.61	1	11	——
April	30.56	29.39	30.00	77	29	51.0	....	N. W.	2.11	1	6	——
May	30.44	29.75	29.04	85	35	59 0	....	S. W.	2.95	———	8	——
June	30.22	29.74	29.95	94	50	69.0	....	S. W.	2.02	———	11	——
For the year.	30.71	29.06	30.08	94	10	51.7	....	N. W.	51.78	7	130	——

* Including melted snow.

OF THE SEASONS.

	Temperature.	Precipitation.
Spring	48.7	9.67
Summer	71.3	12.62
Autumn	54.0	12.40
Winter	33.0	17.09

STATION, NEW YORK CITY, N. Y.

Latitude, 40° 33′ N.; Longitude, 70° 0′ W. Height of Barometer Cistern above Sea Level, 185 feet.

OBSERVER, E. B. DUNN, U. S. SIGNAL SERVICE.

	BAROMETER. (Reduced to 32°.)			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	30.28	29 75	30.04	95	56	73 0	72.0	S.	3.96	....	10	10
August	30.26	29.69	30.03	89	51	72.0	77.0	N. W.	4 06	....	12	11
September	30.39	29.83	30.14	86	46	67.0	79.0	S. W.	7.21	....	11	13
October	30.36	29.35	29 91	74	38	56 0	72 0	N. W.	6.46	....	15	15
November	30.37	29 61	30.07	71	18	46.0	76.0	N. W.	0.82	....	6	5
December	30.60	29.56	30.07	54	13	31.0	72.0	N. W.	5.43	....	13	8
1891.												
January	30.52	29.01	30.04	60	16	35.0	81.0	N. W.	5.73	....	16	10
February	30.72	29 42	30 04	61	13	38.0	77.0	N. W.	4 69	....	16	13
March	30 59	29.53	30.10	61	9	38 0	78.0	N. E.	4.22	....	13	15
April	30 56	29 39	30.00	80	28	52 0	69.0	N. W.	2.57	....	10	6
May	30.45	29.74	30.03	84	38	60.0	68.0	N. W.	3.10	....	11	12
June	30.22	29.74	29.96	94	51	70.0	73.0	N. W.	1.18	....	11	8
For the year.	30.72	29.01	30.04	95	9	53.2	74.1	N. W.	49.23	....	143	120

* Including melted snow.

OF THE SEASONS.

	Temperature.	Precipitation.
Spring	50.0	9.89
Summer	71.7	9.20
Autumn	56.3	14.49
Winter	34.7	15.85

STATION, NEW BRUNSWICK, MIDDLESEX COUNTY, N. J.

Latitude, 40° 29′ N.; Longitude, 74° 10′ W. Height of Barometer Cistern above Sea Level, 90 feet.

OBSERVER, CHAS. V. MEYERS.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	....	....	....	98	45	71.7	....	S. W.	7.20	....	11	10
August	....	....	....	92	45	71.0	....	N. W.	5.55	....	12	10
September	....	....	....	88	37	63.6	....	S. W.	5.26	....	10	[illegible]
October	....	....	....	73	27	52.0	....	N. W.	8.34	....	13	18
November	....	....	....	71	16	42.0	....	N. W.	0.93	....	3	6
December	....	....	....	50	7	27.8	....	N. W.	4.21	....	8	13
1891.												
January	....	....	....	57	12	32.6	....	N. W.	7.70	....	11	14
February	....	....	....	66	9	35.8	....	N. W.	4.86	....	16	11
March	....	....	....	68	6	36.4	....	N. W.	5.83	....	12	14
April	....	....	....	83	25	52.6	....	N. W.	1.75	....	8	6
May	....	....	....	93	31	61.3	....	N. W.	3.20	....	8	15
June	....	....	....	100	44	71.6	....	S. E.	1.62	....	8	7
For the year.	....	....	....	100	6	51.5	....	N. W.	56.45	....	120	132

* Including melted snow.

OF THE SEASONS.

	Temperature.	Precipitation.
Spring	50.1	10.78
Summer	71.4	14.37
Autumn	52.5	14.53
Winter	32.1	16.77

STATION, PHILADELPHIA, PA.

Latitude, 39° 57′ N.; Longitude, 75° 9′ W. Height of Barometer Cistern above Sea Level, 117 feet.

OBSERVER, L. M. DYE, U. S. SIGNAL SERVICE.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (Inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	30.29	29.72	30.06	97	54	74.6	68.0	S. W.	4.03	....	11	10
August	30.26	29.68	30.05	94	51	73.6	76.0	N. W.	3.36	....	12	13
September	30.38	29.88	30.15	88	45	67.2	78.0	N. E.	2.31	....	11	14
October	30.37	29.43	29.93	79	36	55.5	74.0	N. W.	4.82	....	15	20
November	30.41	29.66	30.10	70	23	46.4	70.0	N. W.	0.80	....	7	7
December	30.62	29.42	30.10	52	17	32.2	69.0	N. W.	2.33	....	13	15
1891.												
January	30.55	29.22	30.07	56	17	36.4	74.0	N. W.	3.65	....	10	15
February	30.71	29.48	30.11	69	15	39.6	73.0	N. W.	4.71	....	15	14
March	30.58	29.54	30.11	61	12	38.0	70.0	N. E.	4.42	....	15	16
April	30.54	29.48	30.02	83	30	54 3	59.0	N. W.	2.34	....	10	9
May	30.42	29.76	30.05	90	36	61.0	63.0	N. W.	1.74	....	12	17
June	30.23	29.73	29.97	96	49	71.8	68.0	S. W.	2.51	....	7	8
For the year.	30.71	29.22	30.06	97	12	54.2	70.2	N. W.	37.02	....	138	158

*** Including melted snow.**

OF THE SEASONS.

	Temperature.	**Precipitation.**
Spring	55.1	8.50
Summer	73.3	9.90
Autumn	56.4	7.93
Winter	36.1	10.69

STATION, VINELAND, CUMBERLAND COUNTY, N. J.

Latitude, 39° 29′ N.; Longitude, 75° 0′ W. Height of Barometer Cistern above Sea Level, —— feet.

OBSERVER, WM. W. AUSTIN.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July												
August												
September												
October												
November												
December												
1891.												
January												
February				71	15	40.5		N. W.	5.85			15
March				64	13	39.0		N. E.	7.05			13
April				84	28	53.6		N. W.	2.64			8
May				88	29	59.8		S. W.	2.79			12
June				94	41	70.2		N. W.	3.62			12
For the year.												

* Including melted snow.

STATION, NEWTON, SUSSEX COUNTY, N. J.

Latitude, 41° 2′ N.; Longitude, 74° 43′ W. Height of Barometer Cistern above Sea Level, —— feet.

OBSERVER, D. L. FOSTER.

	BAROMETER. (Reduced to 32°.)			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July												
August												
September				83	33	60.8			4.52		8	
October												
November				59	16	38.6			0.61		2	
December												
1891.												
January												
February												
March				59	6	34.5			4.50		11	
April				76	25	51.3			2.50		11	
May				85	33	59.1			2.23		9	
June				90	47	70.0			1.89		6	
For the year												

* Including melted snow.

STATION, ATLANTIC CITY, ATLANTIC COUNTY, N. J.

Latitude, 39° 32′ N.; Longitude, 74° 25′ W. Height of Barometer Cistern above Sea Level, 53 feet.

OBSERVER, WM. T. BLYTHE, U. S. SIGNAL SERVICE.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	30.26	29.76	30.06	89	52	71.0	80.1	S. W.	5.46	....	10	7
August	30.26	29.70	30.04	90	48	71.0	84.0	S. W.	7.51	....	11	5
September	30.35	29.85	30.14	78	48	66.0	85.0	S. W.	5.01	....	12	9
October	30.33	29.45	29.92	74	35	56.0	79.5	N. W.	4.05	....	15	14
November	30.37	29.62	30.10	70	18	46.0	79.2	S. W.	0.38	1	6	6
December	30.62	29.43	30.08	54	17	34.0	80.1	N. W.	3.33	6	10	7
1891.												
January	30.51	29.23	30.06	55	16	35.0	84.6	N. W.	4.41	1	11	8
February	30.69	29.43	30.11	68	14	39.0	81.2	N. W.	5.89	....	17	11
March	30.54	29.48	30.09	55	14	37.0	78.4	N. E.	3.32	3	14	13
April	30.52	29.48	30.03	79	28	49.0	74.9	S. W.	2.28	....	11	5
May	30.47	29.76	30.05	83	33	57.0	78.4	N. E., S.	3.93	....	13	11
June	30.23	29.73	29.98	91	48	66.0	81.8	S.	1.67	....	8	6
For the year.	30.69	29.23	30.05	91	14	52.2	80.6	S. W.	47.24	11	138	102

* Including melted snow.

OF THE SEASONS.

	Temperature.	Precipitation.
Spring	47.7	9.53
Summer	69.3	14.64
Autumn	56.0	9.44
Winter	38.3	13.63

STATION, CAPE MAY C. H., CAPE MAY COUNTY, N. J.

Latitude, 38° 56′ N.; Longitude, 74° 58′ W. Height of Barometer Cistern above Sea Level, —— feet.

OBSERVER, J. F. LEAMING, M.D.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1890.												
July	....	....	....	96	50	72.8	....	S.	3.89	....	10	......
August	....	....	....	89	48	70.7	....	S.	3.52	....	10	......
September	....	....	....	86	43	67.1	....	S. W.	4.80	....	12	......
October	....	....	....	78	36	56.0	....	N. W.	4.58	....	12	......
November	....	....	....	71	17	46.8	....	N. W.	0.52	....	4	......
December	....	....	....	55	16	34.3	....	N. W.	4.43	....	9	6
1891.												
January	....	....	....	57	18	35.8	....	N. W.	6.16	....	8	3
February	....	....	....	70	11	40.7	....	S. W.	6.34	....	16	16
March	....	....	....	61	13	38.8	....	N. W.	6.39	....	19	12
April	....	....	....	83	30	53.2	....	S.	2.50	....	11	6
May	....	....	....	83	34	59.1	....	E	3.54	....	13	11
June	....	....	....	89	41	67.9	....	S. W.	1.24	....	6	10
For the year.	....	....	....	96	11	53.6	....	N. W.	47.91	....	130	......

* Including melted snow.

OF THE SEASONS.

	Temperature.	Precipitation.
Spring	50.4	12.43
Summer	70.5	8.65
Autumn	56.6	9.90
Winter	36.9	16.93

METEOROLOGICAL SUMMARY FOR THE STATE.

July, 1890.

Temperature (degrees F.)—The mean temperature for July, 1890, 72.5, is 2.0 below the normal, and 0.9 below the mean of the corresponding month of 1889. The chief maxima observed were: 101 at Woodbury, 100 at Beverly, 99 at Billingsport, 98 at Locktown and New Brunswick, and 97 at Egg Harbor City, Tenafly, Moorestown, Rancocas, Trenton and Imlaystown. Temperatures below 40 degrees were recorded at Beverly, Madison and Oceanic. The cool periods of the month were the 10th to 13th and 20th to 23d inclusive.

Precipitation.—The average precipitation for the month, 5.62 inches, is 1.30 inches above the normal, and 4.57 inches below the average for the corresponding month of 1889. All stations, except those in the counties of Cape May, Cumberland and Burlington, report an excess varying from 0.69 to 3.23 inches. The greatest excess is reported from ths counties of Atlantic, Middlesex and Monmouth The average number of clear days was 11.5, fair days, 11.0, and cloudy, 8.5. The weather predictions for the month have been verified as follows: For weather, 89.3 per cent; for temperature, 81.3 per cent.; for weather and temperature combined, 85.3 per cent.

Atmospheric Pressure (in inches)—Monthly mean, 30.05; maximum observed, 30.287, at Philadelphia, on the 21st; minimum observed, 29.716, at Philadelphia, on the 3d; range for the State, 0.571.

Temperature (degrees F)—Monthly mean, 72.4; highest monthly mean, 78.0, at Trenton, Mercer county; lowest monthly mean, 69.3, at Newton, Sussex county; maximum, 101, at Woodbury, Gloucester county, on the 8th; minimum, 38, at Oceanic, Monmouth county, on the 12th; range for the State, 63; greatest local monthly range, 61, at Beverly, Burlington county; least local monthly range, 30, at Ocean City, Cape May county; greatest daily range, 44, at Madison, Morris county, on the 22d; least daily range, 2, at Bridgeton, Cumberland county, on the 2d and 13th.

Precipitation (in inches).—Average for the State, 5.62; greatest, 7.55, at Egg Harbor City, Atlantic county; least, 3.60, at Ocean City, Monmouth county Three stations report a total exceeding 7 inches (New Brunswick, Egg Harbor City and Oceanic), six exceeding 6 inches, and ten 5 inches. The stations reporting the greatest deficiency were Bridgeton, Cape May and Ocean City. Average number of days on which precipitation equaled 0.01 inch, 9.2; average number of days on which cloudiness was 8 or more on a scale of 10, 8.5. *Wind*—Prevailing direction, southwest.

Miscellaneous Phenomena (dates observed).—*Thunder storms* are reported as follows: Beverly, 3d, 4th, 8th, 9th, 12th, 13th, 15th, 16th, 17th and 18th; Locktown, 17th; South Orange, 3d; Freehold, 4th and 12th; Imlaystown, 4th and 17th; Billingsport, 4th, 15th and 17th; Woodbury, 3d, 4th, 13th, 15th and 17th; Rancocas, 3d and 17th; Cape May, 27th; Ocean City, 5th and 26th; Egg Harbor City, 2d, 4th, 5th, 12th, 13th and 17th; Madison, 17th; Oceanic, 3d, 4th, 12th, 13th and 17th; Tenafly, 3d and 17th; Readington, 3d, 4th and 17th; Highland Park, 3d, 4th and 17th. *Hail*—Locktown, 17th; Hopewell, 17th; Imlaystown, 17th; Lambertville, 17th; Woodbury, 17th; Rancocas, 17th; Cape May C. H., 13th. *Solar Halos*—Beverly, 27th; Woodbury, 1st, 2d, 27th and 28th; Rancocas, 27th and 28th. *Lunar Halos*—Egg Harbor City, 24th and 26th. *Meteors*—Beverly, 5th and 6th. *Polar Bands*—Beverly, 12th, 18th and 26th.

OBSERVERS' NOTES.

TRENTON.—No person, except he may have seen the damage to property and crops from a severe hail storm, can form any idea of the great destruction and loss which was sustained by the farmers of that section of. Hamilton township, Mercer county, in the direction of Hamilton Square and on towards Yardville and Allentown, by the storm of the 17th. In many places trees and bushes are stripped of leaves and fruit, and often of their bark; corn has been rendered leafless and the stalks cut off from six to eighteen inches from the ground; potatoes are killed, except for a little spark of green at the ends of the flattened vines; oats are flattened down so that the fields appear as though a heavy roller had been run over the ground, and the oats entirely threshed out by the destructive hail. So far as could be learned, this district extends from Dogtown towards Yardville and Alleatown, in a strip about half a mile wide. The storm appeared to move from the northwest to southeast, and lasted about half an hour. The wind was very severe, but the destruction was caused mainly by hail. The stories told regarding the hail storm seem to be exaggerated and unreasonable, but after seeing what has been done, seem very reasonable. Along the road from Yardville to Newtown, and in various other places, the fences and buildings bear the marks and impressions of the hail-stones as though riddled with grapeshot. The discolored wood of the posts and rails has been knocked off so that the natural color of the wood is seen. Trees are broken and barked, and peach trees so bruised and barked that they are withering and dying. Orchards in places are almost entirely stripped of fruit and leaves Even the blackberry bushes have nothing left but stems. The committee appointed to appraise the damage in Hamilton township by this storm have fixed the amount at $30,902.

CAPE MAY C. H.—The scanty rainfall during the first three weeks of the month, retarded early truck, but rain came in time to save the late truck and corn. On the morning of the 13th a very severe hail storm visited the sea-coast (throughout Upper township and a part of Dennis). It extended but a short distance inland. The hail-stones demolished windows and tore the curtains into shreds, and were also very destructive to crops. Pieces of ice penetrated half-grown watermelons to the center, as if a handle of a hoe had been plunged into them.

HOPEWELL—A very destructive storm passed over this station on the afterneon of the 17th, blowing down many buildings, uprooting trees and prostrating fields of corn.

BILLINGSPORT.—A severe thunder storm occurred on the evening of the 17th, commencing at 7 P. M., ending at 10:30 P. M. The lightning was almost incessant and several buildings were struck in this vicinity.

RANCOCAS—The severe thunder storm which passed over this place on the evening of the 27th was accompanied by a high wind, which prostrated some corn, but no other injury was done. The lightning was one incessant glare and the rainfall very heavy, one inch falling in fifteen minutes. During the storm a few hail-stones fell the size of filberts.

LOCKTOWN—While the hail storm of the 17th did no damage in this vicinity, three or four miles to the west and south many fields of corn, oats and tomatoes were nearly destroyed.

NEWARK—While still suffering under the oppressive heat of the last two days of the month just closed, it is hard to believe that it was a comparatively cool July. Its mean temperature was but 73 degrees, while the mean temperature for the month of

July for the last forty-seven years is placed by our record at 74.12. The month has been a remarkably pleasant one, with many cool nights for slumber, and many delightful days when the fierce rays of the summer sun were tempered by clouds that did not bring the rains with which they drenched us a year ago.

August, 1890.

Temperature (degrees F.)—The mean temperature for the month of August, 1890, 71.5, is 0.5 below the normal, and 1.9 above the mean for the corresponding month of 1889. The chief maxima observed were 99, at Beverly; 96, at Egg Harbor City; 94, at Billingsport, Woodbury and Philadelphia; 93, at Bridgeton, Trenton and Madison, and 92, at Moorestown, Rancocas, New Brunswick and Imlaystown. The chief minimum reported was 40, at Newton, Sussex county. The warmest days of the month were the 1st, 2d and 4th, and the coolest the 23d and 24th. On the latter date a light, harmless frost occurred at Egg Harbor City. The mean temperature of the summer season just closed was 71.6, which is 0.4 below the normal of the season.

Precipitation (in inches).—The average precipitation for the month, 4.90 inches, is 0.16 inches above the normal, and 0.28 inches above the average for the corresponding month of 1889. The largest total reported for the month was 7.51 inches at Atlantic City, and the least, 2.89 inches at Woodbury. The rainfall of the summer of 1890, 14.11 inches, is 4.99 inches less than the amount received during the same period in 1889, and 1.07 above the normal for the summer months. The weather conditions of the month, and of the season, have been most favorable to the agricultural interest of the State, no extended periods of drouth occurring. The staple crops were all harvested and housed under most favorable conditions. The average number of clear days was 8.3; fair days, 15.3, and cloudy, 7.4. The weather predictions for the month have been verified as follows: For weather, 75.9 per cent.; for temperature, 85.8 per cent.; for weather and temperature combined, 80.9.

Atmospheric Pressure (in inches).—Monthly mean, 30.044; maximum observed, 30.260, at Philadelphia and New York City, on the 16th; minimum observed, 29.590, at New York City and Newark, on the 27th; range for State, 0.670.

Temperature (degrees F.)—Monthly mean, 71.5; highest monthly mean, 76.0, at Trenton, Mercer county; lowest monthly mean, 68.5, at Newton, Sussex county; maximum, 99, at Beverly, on the 1st; minimum, 40, at Newton, on the 23d; range for State, 59; greatest local monthly range, 54, at Beverly; least local monthly range, 28, at Ocean City; greatest daily range, 33, at Tenafly and Gillette, on the 17th; least daily range, 3, at Asbury Park, on the 13th.

Precipitation (including melted snow, in inches).—Average for the State, 4.90; greatest, 7.51, at Atlantic City, Atlantic county; least, 2.89, at Woodbury, Gloucester county. Average number of days on which precipitation equaled 0.01 inch, 11.4; average number of days on which cloudiness was 8 or more on a scale of 10, 7.4. *Wind*—Prevailing direction, northwest.

Miscellaneous Phenomena (dates observed).—*Thunder storms* are reported as follows: Beverly, 1st, 5th, 8th, 9th, 10th, 14th, 17th, 19th, 20th, 21st, 22d, 26th and 29th; Egg Harbor City, 1st, 6th, 10th, 13th, 19th, 20th and 21st; Trenton, 1st, 21st, 22d and 26th; Madison, 10th, 14th, 17th, 19th, 21st, 22d and 28th; Imlaystown, 10th, 20th, 21st and 22d; South Orange, 19th, 21st and 22d; Rancocas, 1st, 21st, 22d and 29th; Woodbury, 1st, 9th, 17th, 19th, 21st, 22d and 29th; Tenafly, 6th, 16th and 29th; Bridgeton, 19th and 20th; Cape May C. H., 1st, 5th and 25th; Oceanic, 1st, 9th, 10th, 19th, 20th and 21st; Billingsport, 1st, 19th, 21st, 22d and 30th; Highland Park, 1st, 10th, 17th, 19th, 20th and 21st. *Hail*—Beverly, on the 8th. *Solar Halos* were observed at Woodbury on the 6th; Egg Harbor City, 26th, and at Beverly, Moorestown, Rancocas and Woodbury on the 28th. *Lunar Halos* were observed at Billingsport, Oceanic, Tenafly, Woodbury, Rancocas, Madison, Egg Harbor City and Beverly on the 28th. *Meteors* were observed at Beverly on the 4th, 5th, 10th and 20th; at Trenton on the 7th and 9th, and at Woodbury on the 9th and 20th. *Light Frost* at Egg Harbor City on the 24th. *Polar Bands* were observed at Beverly on the 7th, 10th and 28th.

OBSERVERS' NOTES.

NEWARK.—The mean temperature of the summer, which has just closed with the month, was 71.67, while that of its forty seven immediate predecessors was 71.72. The summer waterfall was 15.04 inches, while the average of the same predecessors was 13.112 inches. The summer of 1889 gave us 22.47 inches.

The total number of deaths by wind storms and lightning since January last is estimated at 1,100, as compared with only 163 deaths from the same causes during the whole of 1889. This is a record which will make this year memorable in the annals of meteorology.

September, 1890.

TEMPERATURE (degrees F.)—The mean temperature for the month of September, 1890, 64.4, is 0.9 below the normal for the month, and 0.4 below the mean of the corresponding month of 1889. The chief maxima observed were 91 at Woodbury, Gloucester county; 90 at Oceanic, Monmouth county, and 89 at Madison, Morris county. The chief minima observed were 33 at Tenafly, Bergen county; Newton, Sussex county; Gillette and Madison, Morris county, and 37 at Highland Park, Middlesex county, and Locktown, Hunterdon county. The warmest days of the month were the 3d, 5th and 6th, and the coolest the 24th, 25th and 30th. The first light frost of the season was very generally reported on the mornings of the 24th and 25th, and the first killing frost on the mornings of the 25th and 30th, from the counties of Morris, Bergen and Sussex.

PRECIPITATION (in inches).—The average precipitation for the month, 4.75 inches, is 0.86 inches above the normal for the month, and 0.28 inches above the average for the corresponding month of 1889. One station (Egg Harbor City) reports a total exceeding 8.50 inches, 2 exceeding 7.00 inches, 1 exceeding 6.00 inches and 8 exceeding 5.00 inches. During the month rains were quite general throughout the State, on the 6th, and from the 11th to 17th, inclusive, and on the 26th and 27th. The average number of clear days was 10.2; fair days, 9.8, and cloudy, 9.9. The weather predictions for the month have been verified, as follows: For weather, 83.4 per cent.; for temperature, 88.9 per cent.; for weather and temperature combined, 86.2.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.136; maximum observed, 30.390, at New York City, on the 25th; minimum observed, 29.810, at Newark, on the 17th; range for the State, 0.580.

TEMPERATURE (degrees F.)—Monthly mean, 64.4; highest monthly mean, 68.5, at Bridgeton, Cumberland county; lowest monthly mean, 60.8, at Newton, Sussex county; maximum, 91, at Woodbury, Gloucester county, on the 5th; minimum, 33, at Tenafly, Bergen county; Madison, Morris county; Newton, Sussex county, and Gillette, Morris county, on the 24th, 25th and 30th; range for the State, 58; greatest local monthly range, 56, at Madison, Morris county; least local monthly range, 26, at Ocean City, Cape May county; greatest daily range, 37, at Madison, Morris county, on the 30th; least daily range, 1, at Newark, Essex county, and Moorestown, Burlington county, on the 14th and 22d respectively.

PRECIPITATION (including melted snow, in inches).—Average for the State, 4.75; greatest, 8 61, at Egg Harbor City, Atlantic county; least, 2.59, at Locktown, Hunterdon county; average number of days on which precipitation equaled 0.01 inch, 10.1; average number of days on which cloudiness was 8 or more on a scale of 10, 9.9. *Wind*—Prevailing direction, southwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder storms* were reported at Trenton on the 6th, 12th, 13th, 16th; Imlaystown, 13th; Highland Park, 5th, 12th, 13th, 15th, 16th, 17th; Rancocas, 13th; Readington, 13th; Oceanic, 5th, 6th, 12th, 13th, 14th, 15th, 16th, 17th; Beverly, 5th, 6th, 13th, 15th, 16th; Billingsport, 6th; Bridgeton, 6th; Madison 12th, 13th, 16th; Cape May, 6th, 13th, 14th, 27th; Egg Harbor City, 6th, 12th, 13th, 14th, 15th, 16th, 17th; Philadelphia, 6th, 15th; New York City, 5th, 12th, 13th, 16th, 17th. The first light frost of the season was reported from the following stations: Woodbury, 24th, 25th; Newton, 24th, 25th; Readington, 25th; Tenafly, 24th, killing, 25th, 30th; Moorestown, 25th, 30th; Gillette, 25th, 26th, killing, 30th; Junction, 25th; Madison, 25th, ice forming in low places; Trenton, 25th; Locktown, 25th, 29th; Philadelphia, 25th, 29th; Woodbury, 6th, 15th, 16th, 17th. *Solar Halos*—Woodbury, 2d, 20th, 28th; Rancocas, 2d; Egg Harbor City, 10th, 16th; Madison, 28th; New York City, 2d, 3d. *Lunar Halos*—Trenton, 25th, 28th; Imlaystown, 25th; Woodbury, 22d; Beverly, 25th, 28th, 29th, 30th; Oceanic, 28th; Madison, 28th; New York City, 2d, 3d, 25th, 26th, 3′ th.

OBSERVERS' NOTES

NEWARK.—The mean temperature of the month was 65.41 degrees, while the mean temperature of September during the past 47 years has ranged from 59.98 degrees to 73.72 degrees. The temperature, then, of the past month may be regarded as about the average for September. The first seventeen days were comparatively warm, but continuous rains from the 10th to the 18th, followed by a lower temperature, gave the impression that the month was far cooler than it really was. The first four days were exceedingly beautiful, and these were followed at intervals by thirteen days of very enjoyable weather. The waterfall of the month was 5.13 inches, and came to us on 12 days, varying in quantity from 0.04 of an inch to 1.75, the latter fall occurring on the 12th, and being the greatest waterfall within 24 successive hours. The total precipitation occupied but 53 hours, 47 of which were recorded between the 10th and 18th. The month's waterfall was considerably above the average for September, which, according to our record, is 3.58 inches. On the morning of the 25th, the first frost of the season was observed in this vicinity.

CAPE MAY C. H.—The month has been unusually genial, the thermometer marking above 70 degrees on 21 days. The rains have been copious. The fall crops are in excellent condition.

October, 1890.

TEMPERATURE (degrees F.)—The mean temperature for the month of October, 1890, 53.9, is 0.4 below the normal for the month, and 3.1 above the mean of the corresponding month of 1889. The chief maxima observed were 81 at Beverly, Burlington county; 79 at Moorestown, Burlington county, and 78 at Cape May C. H., Trenton, Mercer county, and New Brunswick, Middlesex county. The chief minima observed were 24 at Tenafly, Bergen county; 25 at Allaire, Monmouth county, and Gillette, Morris county; 26 at Madison, Morris county, and 27 at Egg Harbor City, Atlantic county, and New Brunswick, Middlesex county. The warmest days of the month were the 1st, 3d, 4th, 5th and 10th, and the coldest the 22d, 30th and 31st. The first light frost of the season is reported from the following stations: Moorestown, Burlington county, 22d (general and heavy on upland, blackened foliage, but did not destroy vines of tomatoes and sweet potatoes; ripe raspberries were gathered on 31st); Allaire and Imlaystown and Oceanic, Monmouth county, on 22d, and Billingsport, Gloucester county, on the 31st.

PRECIPITATION (in inches).—The average total precipitation for the month of October, 1890, 6.33, is 3.14 above the normal for the month, and 2.53 above the average for the corresponding month of 1889. The stations receiving the greatest amount were those in Monmouth, Bergen and Middlesex counties. In the former the excess (above normal) was 6.79. During the month rains were quite general throughout the State on the 2d, 3d, 6th, 7th, 14th, 16th, 17th, 19th, 20th, 23d, 24th and 29th. The average number of cloudless days was 8.4; partly cloudy, 8.4, and cloudy, 14.2. The average number of days upon which rain fell was 13.1. The weather predictions for the month have been verified as follows: For weather, 83.2 per cent.; for temperature, 88.2 per cent.; for weather and temperature combined, 85.7.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 29.909; maximum observed, 30.370, at Philadelphia, Pa., on the 9th; minimum observed, 29.348, at New York city, on the 29th; range for the State, 1.022.

TEMPERATURE (degrees F.)—Monthly mean, 53.9; highest monthly mean, 57.0, at Bridgeton, Cumberland county, and Trenton, Mercer county; lowest monthly mean, 50.0, at Princeton, Mercer county; maximum, 81, at Beverly, Burlington county, on the 1st; minimum, 24, at Tenafly, Bergen county, on the 31st; range for the State, 57; greatest local monthly range, 53, at Beverly, Burlington county; least local monthly range, 33, at Ocean City, Cape May county; greatest daily range, 35, at Beverly, Burlington county, on the 1st; least daily range, 2, at Oceanic, Monmouth county, on the 19th and 23d.

PRECIPITATION (including melted snow, in inches).—Average for the State, 6.33; greatest, 10.18, at Oceanic, Monmouth county; least, 3 40, at Ocean City, Cape May county. Average number of days on which precipitation equaled 0.01 inch, 13.1; average number of days on which cloudiness was 8 or more on a scale of 10, 14.2. *Wind*—Prevailing direction, northwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder Storms*—Trenton, 19th and 29th; Moorestown, 29th; Beverly, 3d, 19th, 29th; Tenafly, 19th; Allaire, 19th, 29th; Rancocas, 3d, 19th, 29th; South Orange, 19th; Woodbury, 29th; Imlaystown, 18th, 29th; Oceanic, 3d, 19th, 29th; Madison, 3d, 19th; Billingsport, 29th; Princeton, 29th. *Hail*—Oceanic, 19th; Woodbury, 29th; Rancocas, 29th; Beverly, 29th; Moorestown, 29th; South Orange, 30th; Philadelphia, 30th. *Solar Halos*—Woodbury, 16th, 22d, 27th, 28th; Rancocas, 22d, 27th; Egg Harbor City, 16th, 22d; Beverly, 28th. *Lunar Halos*—Trenton, 22d, 25th; Moorestown, 22d; Beverly, 22d, 25th, 26th; Tenafly, 28th; Egg Harbor City, 22d; Rancocas, 22d, 26th; Woodbury, 22d, 26th, 28th; Imlaystown, 22d; Oceanic, 22d, 26th; Madison, 26th. Frosts were quite general throughout the State on the 9th, 10th, 13th, 15th, 18th, 22d and 31st. Auroras were observed at Madison, 5th; Egg Harbor City, Beverly, Moorestown, Rancocas and Madison on the 17th.

November, 1890.

TEMPERATURE (degrees F.)—The mean temperature for the month of November, 1890, 43 8, is 1.7 above the normal and 1.9 below the corresponding month of 1889. The chief maxima observed were 74 at Beverly, Burlington county; 73 at Egg Harbor City, Atlantic county; 72 at Bridgeton, Burlington county, and Trenton, Mercer county; 71 at Moorestown, Burlington county, and New Brunswick, Middlesex county; 70 at Atlantic City, Atlantic county, South Orange, Essex county, Woodbury, Gloucester county, Locktown and Readington, Hunterdon county, and Madison, Morris county. The chief minima observed were 11 at Freehold, Monmouth county, and 15 at Egg Harbor City, Atlantic county. The warmest days of the month were the 6th, 7th, 8th and 9th, and the coldest the 27th and 28th. The highest and lowest temperatures during the month were recorded on the 8th and 28th respectively.

PRECIPITATION (in inches).—The average total precipitation for the month of November, 1890, 0.82, is 2.60 below the normal for the month, and 7.66 below the average for the corresponding month of 1889. The stations bordering on the seacoast receiving the least and those in the counties of Middlesex, Mercer, Burlington and Hunterdon receiving the greatest amounts. The former report totals varying from 0.38 to 0.56 of an inch, and the latter amounts slightly in excess of 1.00 inch. The average amount received for the month is the smallest of which we have any record. The snowfall was very light, only a trace being reported. The average number of cloudless days was 12.8, partly cloudy 11.9, and cloudy 5.5. The average number of days upon which rain fell was 4.2. The weather predictions for the month have been verified as follows: For weather, 89.1 per cent.; for temperature, 82.8 per cent.; for weather and temperature combined, 85.9 per cent. The average temperature for the autumn season just closed was 54.0 degrees, the average for the previous autumn being 54.2 degrees. The average precipitation for the same period was 11.90 inches, as against 16.75 inches for the autumn of 1889.

ATMOSPHERIC PRESSURE (in inches)—Monthly mean, 30.086; maximum observed, 30.410, at Philadelphia, on the 12th; minimum observed, 29.608, at New York City, on the 30th; range for State, 0.802.

TEMPERATURE (degrees F.)—Monthly mean, 43.8; highest monthly mean, 47.2, at Ocean City, Cape May county; lowest monthly mean, 38.6, at Newton, Sussex county; maximum, 74, at Beverly, Burlington county, on the 8th; minimum, 11, at Freehold, Monmouth county, on the 28th; range for State, 63; greatest local monthly range, 58, at Egg Harbor City, Atlantic county, and Freehold, Monmouth county; least local monthly range, 40, at Lambertville, Hunterdon county; greatest daily range, 38, at Readington, Hunterdon county, on the 14th; least daily range, 1, at Egg Harbor City, Atlantic county, on the 11th.

PRECIPITATION (including melted snow, in inches).—Average for the State, 0.82; greatest, 1.10, at Trenton, Mercer county; least, 0.38, at Atlantic City, Atlantic county. Average number of days on which precipitation equaled 0.01 inch, 4.2. Average number of days on which cloudiness was 8 or more on a scale of 10, 5.5. *Wind*—Prevailing direction, northwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder Storm* (distant)—Moorestown, 2d. *Hail*—Tenafly, 11th; Highland Park, 19th; Egg Harbor City, 20th and 27th; South Orange, 11th; Woodbury, 20th. *Solar Halos*—Woodbury, 8th; Rancocas, 8th, 15th, 26th. *Lunar Halos*—Imlaystown, 25th and 29th; Rancocas, 24th; Egg Harbor City, 25th; Moorestown, 24th, 25th; Beverly, 17th, 19th, 23d, 24th, 25th, 26th, 27th, 29th. *Meteors*—Beverly, 5th, 15th, 28th; Trenton,, 13th, 19th, 29th; Egg Harbor City, 5th, 6th, 18th; Woodbury, 13th. *Auroras*—Rancocas, Madison, Egg Harbor City, Readington, on the 7th.

OBSERVERS' NOTES.

CAPE MAY C. H.—The weather during the month was particularly fine. No high winds or heavy rain storms passed over this station. The precipitation was unusually small.

BEVERLY.—A very pleasant month. Weather more autumnal-like than November generally.

FREEHOLD.—The minimum temperature recorded on the morning of the 28th, 11.0, is five degrees lower than that recorded during November, 1888, and six degrees lower for the same month of 1889. The mean temperature for the month, 43.7, is 1.7 lower than that for 1888, and 0.7 lower than the mean for 1889. Dense fog prevailed on the 6th, 7th, 8th, 13th and 30th.

NEW BRUNSWICK.—The month of November, 1890, will go on record as remarkable for its equability of temperature, abnormally small precipitation and great number of fair days (26). My records date back to 1854, and in comparison with same month of other years I find that the average maxima temperature for this month is but 52.1, while in other years it has been much higher. The average minima temperature for this month was 32.0, which is higher than any other previous year, the next highest being 31.0, in 1873, thus showing the smallest range of temperature since 1854. The rainfall for the month was only 0.93 inches, which is the least for any November upon my records. The next smallest amount being 1.49 inches in 1883. Only three stormy days during the month, while other Novembers have considerably more. Only a trace of snow fell during the month, while on the 7th of November, 1862, we had a violent snow storm, which measured 10 inches in depth. The coldest day in November since 1854 was the 30th, 1875, on which day the minimum thermometer recorded 12 and the maximum 19.5; mean temperature of the day, 15.8. On this date the Raritan river was frozen solid from edge to edge.

RANCOCAS.—The aurora of the 7th inst. was very brilliant from 8 to 9 P. M. The arch reached an altitude of 40 degrees, and corruscations 5 to 10 higher. The lunar halo observed on the night of the 24th was very uncommon, being composed of the rainbow colors.

WOODBURY.—Ice formed on the 1st, 5th, 21st, 27th, 28th, 29th and 30th. The ground was frozen hard on these dates. Paraselenes (mock moons) were observed on the nights of the 22d and 23d.

OCEANIC.—The month closes with the ground free from frost and grain still growing and pasture good. Some indications of budding on the maple, cherry and plum trees, but not to a dangerous degree as yet.

MOORESTOWN.—Indian summer. Dense haze on the 5th, 6th, 8th and 9th, and quite frequently during the month. Heavy snow squalls on the 20th, the first of the season, melting as it fell. A perfect rainbow, the arch being entire, was observed on the morning of the 25th.

December, 1890.

TEMPERATURE (degrees F.)—The mean temperature for the month, 30.9, is 1.6 below the normal for the month and 10.6 below the mean for the corresponding month of 1889. The chief maxima observed were 56, at Bridgeton, Cumberland county; 55 at

Egg Harbor City, Atlantic county, and Cape May C. H.; 54, at Atlantic City, Atlantic county; Trenton, Mercer county; Allaire, Freehold and Imlaystown, Monmouth county. The chief minima observed were 3, at Tenafly, Bergen county; 5, at Madison, Morris county, and Locktown, Hunterdon county; 8, at Beverly, Burlington county, and 9, at Allaire, Monmouth county, and New Brunswick, Middlesex county. The warmest days of the month were the 2d, 3d, 11th, 15th, 17th and 23d, and the coolest the 28th and 29th. The mean temperature for the month is the lowest recorded since December, 1886, when it was 2 2 below the normal.

Precipitation (in inches).—The average total precipitation for the month, 3.89 inches, is 0.27 inches above the normal for the month and 2.27 above the average for the corresponding month of 1889. During the month precipitation, in the form of rain or snow, was quite general throughout the State on the 1st, 3d, 6th, 8th, 17th, 21st, 26th and 29th. On the 17th all stations except three, Moorestown, Lambertville and Asbury Park, report the heaviest rainfall of the month, varying from 1.60 to 2.41 inches. The depth of snow on the ground at the close of the month was from one-half to five inches.

Atmospheric Pressure (in inches).—Monthly mean, 30.073. Maximum observed, 30.62, at Atlantic City on the 20th. Minimum observed, 29.420, at Philadelphia on the 17th. Range for State, 0.653.

Temperature (degrees F.)—Monthly mean, 30.9. Highest monthly mean, 35.4, at Bridgeton, Cumberland county. Lowest monthly mean, 27.4, at Madison, Morris county. Maximum, 56, at Bridgeton, Cumberland county, on the 23d. Minimum, 3, at Tenafly, Bergen county, on the 30th. Range for State, 53. Greatest local monthly range, 46, at Tenafly, Bergen county. Least local monthly range, 30, at Ocean City, Cape May county. Greatest daily range, 41, at Egg Harbor City, Atlantic county, on the 3d. Least daily range, 1, at Tenafly, Bergen county, on the 31st.

Precipitation (including melted snow, in inches).—Average for the State, 3.89. Greatest, 5.74, at Oceanic, Monmouth county. Least, 2.34, at Lambertville, Hunterdon county. Average number of days on which precipitation equaled 0.01, 8.5. *Wind*—Prevailing direction, northwest.

Miscellaneous Phenomena (dates observed).—*Solar Halos* were observed at Beverly on the 25th; Oceanic on the 30th, and at New York on the 1st, 9th, 11th, 14th, 16th, 25th and 30th. *Lunar Halos* were observed as follows: Beverly, 20th, 22d and 27th; Rancocas, 6th, 20th and 22d; Moorestown, 20th and 29th; Egg Harbor City, 20th, 21st and 22d; Tenafly, 25th; Trenton, 27th; Oceanic, 25th; Madison, 25th; New York, 25th, 30th and 31st; Billingsport, 22d. *Lunar Corona*—Moorestown, on the 25th, at 9 P. M. *Meteors*—Beverly, 10th. *Polar Bands*—Beverly, 21st. *Hail*—Moorestown, 10th and 26th. *Sleet*—Rancocas, 3d, 23d, 26th; Moorestown, 5th; Cape May, C. H., 26th; Readington, 25th. *Snow* fell at nearly all stations on the 1st, 2d, 3d, 8th, 26th and 29th. The average number of cloudless days was 11.3; partly cloudy, 9.5, and cloudy, 10.3.

OBSERVERS' NOTES.

Newark.—The mean temperature of the month was two and a half degrees below the mean of December for the last forty-seven years. It was the coldest December we have had in this vicinity since 1880, and strongly in contrast with December of last year with its mean temperature of 41 degrees. The mean temperature of the year, 52 8, is more than a degree and a half above the mean of the preceding forty-six years, though a trifle less than that of 1889. The waterfall of the year, 50.88 inches, is 14 inches less than the waterfall of 1889, but, still, is 4 inches above the average of former years.

Moorestown.—The normal temperature for the month of December, determined from tri-daily observations made during the past twenty-six years, is 32.6, which is 2.3 above the mean for the past month. The highest mean temperature for the month, 41.0, was recorded in 1889, and the lowest mean temperature, 23.9, in 1876. The average precipitation of the past twenty-six Decembers is 3.33 inches, and the total for the month just closed, 2.99 inches. The greatest amount recorded was 5.77 inches in December, 1862, and the least, 0.90 inches in December, 1877.

Cape May C. H.—The snow on the 8th gave us two or three days of the finest sleighing we have had for several years. The mean temperature of the month, 34.3, is 3.3 below the normal for the month, and the total precipitation, 4.43, is only 0.09 inches below the normal for the month.

Oceanic.—At the close of the month the ground is covered with two inches of snow. Navigation on the North Shrewsbury river is closed. The ice is about three inches thick.

Trenton.—Rain fell on one hundred and ten days during the year and measured 50.80 inches. The greatest monthly total was 7.56 inches for October, and the least, 1.10 inches, during November. Twenty-six thunder storms passed over the station. The first frost occurred on September 25th and the first ice formed on October 31st.

Temperature (degrees F.)—Annual mean, 53.2. Highest annual mean, 56.7, at Bridgeton, Cumberland county, and Trenton, Mercer county. Lowest annual mean, 50.4, at Tenafly, Bergen county. Highest temperature, 101, at Woodbury, Gloucester county, July 8th. Lowest temperature, zero, at Tenafly, Bergen county, March 7th. Range for the State, 101.

COMPARATIVE MEAN TEMPERATURE BY SEASONS.

	1889.	1890.	NORMAL.
Mean winter temperature	35.1	40.9	31.2
Mean spring temperature	51.3	49.6	48.1
Mean summer temperature	71.0	71.6	70.0
Mean autumn temperature	53.3	54.0	53.9

Precipitation (including melted snow, in inches).—Average for the year, 49.34. Greatest, 62.23, at Oceanic, Monmouth county. Least, 41.17, at Woodbury, Gloucester county. Greatest monthly, 9.97, at Freehold, Monmouth county, September. Least monthly, 0.38, at Atlantic City, Atlantic county, October. Average number of days on which rain or snow fell, 117.6. Average number of days on which cloudiness was 8 or more on a scale of 10, 116.4.

COMPARATIVE PRECIPITATION BY SEASONS.

	1889.	1890.	NORMAL.
Average winter	9.50	8.08	10.27
Average spring	13.08	12.97	11.64
Average summer	19.65	11.11	12.86
Average autumn	21.11	11.90	11.68

January, 1891.

TEMPERATURE (degrees F.)—The mean temperature for the month, 34.2, is 4.7 above the normal for the month and 7.1 below the mean for the corresponding month of 1890. The chief maxima observed were 59 at Egg Harbor City, Atlantic county; 57 at Cape May Court House, Cape May county, Bridgeton, Cumberland county, New Brunswick, Middlesex county, and Freehold, Monmouth county. The chief minima observed were 10 at Tenafly, Bergen county; 12 at New Brunswick, Middlesex county, Gillette and Madison, Morris county; 14 at Asbury Park, and Freehold, Monmouth county, South Orange, Essex county, and Egg Harbor City, Atlantic county. The warmest days of the month were the 2d at stations bordering on the sea-coast, and the 22d in the remaining districts of the State. The coldest days were the 4th and 6th. The average daily range of temperature determined from self-registering thermometers was 14.6, the greatest being 18.6, at New Brunswick, and the least, 10.4, at Oceanic.

PRECIPITATION (in inches).—The average total precipitation for the month, 6.57 inches, is 2.93 inches above the normal and 4.28 inches above the average for January, 1890. Rain or snow was general throughout the State on the 1st, 2d, 11th, 12th. 17th, 18th, 22d, 25th, 29th and 31st. The storm of wind, rain, sleet and snow on the 25th caused great damage to telegraph lines, especially between Monmouth Junction, and Trenton. Between these points nearly every telegraph pole was prostrated to the ground. Communication was completely cut off for nearly a week, and is not yet fully restored.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.036; maximum observed, 30.550, at Philadelphia, on the 9th; minimum observed, 29.015, at New York City, on the 12th; range for the State, 1.535.

TEMPERATURE (degrees F.)—Monthly mean, 34.2; highest monthly mean, 37.8, at Bridgeton, Cumberland county; lowest monthly mean, 30.8, at Tenafly, Bergen county; maximum, 59, at Egg Harbor City, Atlantic county, on the 2d; minimum, 10, at Tenafly, Bergen county, on the 6th, 9th, 20th; range for the State, 49. Greatest local monthly range, 45, at Egg Harbor City, Atlantic county; least local monthly range, 31, at Ocean City, Cape May county; 'greatest daily range, 31, at Gillette, Morris county, on the 28th; least daily range, 1, at Franklinville, Gloucester county, on the 17th.

PRECIPITATION (including melted snow, in inches).—Average for the State, 6.57; greatest, 10.55, at South Orange, Essex county; least, 4.41, at Atlantic City, Atlantic county. Average number of days on which precipitation equaled 0.01 inch, 10.5. Average number of days on which cloudiness was 8 or more on a scale of 10, 10.2. *Wind*—Prevailing direction, northwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder Storms*—Rancocas, distant lightning on the evening of 11th; Lambertville, distant lightning on the evening of 11th; Beverly, 11th; Tenafly, 3d; Madison, 11th. *Solar Halos*—Oceanic, 9th; Beverly, 21st; Egg Harbor City, 21st, 24th, 28th; Rancocas, 21st. *Lunar Halos*—Rancocas, 18th, 20th, 26th, 31st; Egg Harbor City, 15th, 20th, 21st; Beverly, 15th, 20th, 21st, 22d, 26th; Trenton, 21st; Imlaystown, 21st; Madison, 15th, 20th, 21st; Billingsport, 20th; Oceanic, 15th, 22d; Moorestown, 15th. *Sleet*—Moorestown, 17th, 18th (covering the trees heavily until the 20th); Allaire, 17th; Tenafly, 1st, 17th; Oceanic, 17th; Billingsport, 17th, 31st; Highland Park, 25th; Madison, 17th; Trenton, 1st, 17th, 31st; Beverly, 17th, 25th; Egg Harbor City, 31st; Rancocas, 17th. *Snow*—Franklinville, 25th; Asbury Park, 5th, 25th; Rancocas, 25th; Lambertville, 17th, 25th; Trenton, 1st, 4th, 5th, 18th, 24th, 25th; Madison, 4th, 5th, 25th; Freehold, 21st; Highland Park, 4th, 5th, 17th, 25th; Oceanic, 4th, 5th, 25th; Tenafly, 4th, 5th, 19th, 25th; Allaire, 5th, 25th; New Brunswick, 5th, 13th, 25th; Junction, 17th, 25th; Locktown, 1st, 18th, 25th; Moorestown, Gillette, Imlaystown, Beverly, 25th. *Meteors*—Beverly, 16th. *Polar Bands*—Franklinville, 30th.

OBSERVERS' NOTES.

BEVERLY.—The month was noted for its excessive rains. The heavy storm of the 25th was preceded by heavy "hoar frosts." No interference to navigation from ice after the 20th.

FRANKLINVILLE.—At the close of the month the ground was free from frost and farmers were plowing. Ice was stored between the 3d and 5th of a thickness from three to five inches.

FREEHOLD.—Dense fogs on the 2d, 28th and 29th. High winds on the 11th and 12th. Hail and sleet on the 17th, clinging to the trees and breaking down the limbs of pines and evergreens.

BILLINGSPORT.—At the close of the month the Delaware river was entirely free from ice. The farmers are plowing.

NEWARK.—The month was replete with discomforts, and so variable in temperature as to fill with apprehension the vigorous as well as the feeble. Its mean temperature, 33.3, was considerably above the mean of its forty-seven predecessors, but it was much below that of January, 1890, and even of January, 1889. The waterfall of the month, 7.11 inches, was much above the average for corresponding months. In fact it was the largest waterfall in this locality during the last forty-seven years.

CAMDEN.—The rivers were free from ice after the middle of the month. The storm of wind and snow on the 25th caused great damage to the telegraph lines, cutting off all communication for two days.

CAPE MAY C. H.—Excepting the large amount of precipitation the month has been remarkable for its negative phenomena. No snows, no sleet, no severe storms, and only two winds that could be marked as "high," and that of short duration. The cold wave between the 4th and 12th afforded a moderate harvesting of ice.

February, 1891.

TEMPERATURE (degrees F.)—The mean temperature for the month, 38.0, is 6.5 above the normal for the month, and 1.9 below the mean for the corresponding month of 1890. The chief maxima observed were 71 at Vineland, Cumberland county; 70 at Cape May C. H., Cape May county, Bridgeton, Cumberland county, and 69 at Egg Harbor City, Atlantic county, and Camden, Camden county. The chief minima observed were 1 at Tenafly, Bergen county; 2 at Dover, Morris county, and 5 at Madison, Morris county. The warmest days of the month were the 17th, 18th and 25th, and the coldest the 5th and 28th. The average daily range of temperature, determined from self-registering thermometers, was 15.9. The greatest being 19.3 at Beverly, Burlington county, and the least 12.1 at Oceanic, Monmouth county.

PRECIPITATION (in inches).—The average total precipitation for the month, 5.11, is 1.65 above the normal and 0.94 above the average for February, 1890. Precipitation, in the form of rain or snow, was very general throughout the State on the 1st, 3d, 6th, 7th, 8th, 9th, 10th, 16th, 17th, 20th, 21st, 22d, 25th, 26th and 27th.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.088; maximum observed, 30.720, at New York City, on the 15th; minimum observed, 29.400, at Newark, on the 26th; range for the State, 1.320.

TEMPERATURE, (degrees F.)—Monthly mean, 38.0; highest monthly mean, 42.5, at Bridgeton, Cumberland county; lowest monthly mean, 33.6, at Dover, Morris county; maximum, 71, at Vineland, Cumberland county, on the 28th; minimum, 1, at Tenafly, Bergen county, on the 28th; range for the State, 70; greatest local monthly range, 60, at Beverly, Burlington county; least local monthly range, 42, at Pochunk Mt. (Deckertown), Sussex county; greatest daily range, 41, at Vineland, Cumberland county, on the 16th; least daily range, 2, at Billingsport, Gloucester county, South Orange, Essex county, and Dover, Morris county, on the 2d, and Atlantic City, Atlantic county, on the 19th.

PRECIPITATION (including melted snow, in inches).—Average for the State, 5.11; greatest, 7.20, at Egg Harbor City, Atlantic county; least, 3.70, at Junction, Hunterdon county; average number of days on which precipitation equaled 0.01 inch, 14.0; average number of cloudless days was 6.1; partly cloudy, 9.2, and cloudy, 12.7. *Wind*—Prevailing direction, northwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder storms*—Egg Harbor City, 17th; Salem, 17th; Franklinville, 17th; Bridgeton, 17th; distant lightning was observed at the following stations on the evening of the 28th: Oceanic, Lambertville, Dover, Beverly, Trenton, Moorestown, Rancocas, Madison and Highland Park. *Solar Halos*—Rancocas, 18th and 28th; Trenton, 19th; Dover, 19th and 28th; Billingsport, 12th; Egg Harbor City, 12th, 23d and 24th. *Lunar Halos*—Junction, 17th, 19th and 23d; Egg Harbor City, 15th and 23d; Salem, 22d; Highland Park, 22d; Oceanic, 18th, 22d and 24th; Beverly, 15th, 16th, 17th, 19th and 22d; Trenton, 19th; Rancocas, 2d, 15th, 22d and 25th. *Sleet*—Madison, 17th; Rancocas, 20th; Trenton, 20th; Beverly, 17th; Dover, 26th; Billingsport, 16th, 20th; Camden, 20th; Highland Park, 20th; Salem, 12th and 20th; Egg Harbor City, 20th; Tenafly, 6th, 7th and 20th. *Polar Bands*—Beverly, 15th and 22d; Madison, 23d. *Auroras*—Madison, faint beams observed at 10:30 P. M.

WINTER MEAN TEMPERATURE AND PRECIPITATION.—The mean temperature of the winter of 1890–91, 34.4 degrees, is 3.2 degrees above the normal, and 6.5 degrees below the mean for the winter of 1889–90. The average precipitation for the winter of 1890–91, 15.57 inches, is 4.85 inches above the normal, and 7.49 inches above the average for the winter months of 1889–90.

OBSERVERS' NOTES.

MOORESTOWN.—Bluebirds singing on 14th and 17th; blackbirds, 17th and 18th, Bees feeding on open maple blossoms, 24th. Mean winter temperature 1890–91, 34.1, is 3.0 above the mean of previovs twenty-seven winters. The average precipitation for the winter of 1890–91, 13.34 inches, is 3.22 inches above the average of previous twenty-seven winters.

DOVER.—The weather during the month was particularly noted for its light rains, which fell on fifteen days during the month. Notwithstanding the frequency of the rain, the average rainfall was slightly below the normal for February. The snowfall was a little in excess of the average, but did not remain long enough for sleighing.

RANCOCAS.—February went out with a record that follows closely that of the corresponding month of 1890. No frost in the ground, grass growing quite perceptibly, buds swelling, bluebirds and song sparrows warbling their spring melodies. Fruit buds are not advanced to a dangerous degree. Maple trees were in bloom on the 18th.

BILLINGSPORT.—Frogs were piping on the 17th. Blackbirds in large flocks on the 16th.

IMLAYSTOWN.—Robins quite numerous on the 26th. Frogs were heard from the 18th to 26th, inclusive.

FRANKLINVILLE.—The weather has been comparatively mild and moist and the ground unfrozen throughout the month. Robins appeared on the 4th and blackbirds on the 10th. The first piping of frogs was heard on the 17th. Bluebirds and killdeer plover made their appearance. By the 18th lily bulbs had sent up sprouts an inch or so. On the 21st numerous castings of earthworms were seen.

SOUTH ORANGE.—Frogs piping on the 25th.

SALEM.—At the close of the month dandelions were in bloom in the fields. Peach and other buds are swelling. Continued warm weather, followed by a cold snap, would endanger the peach crop.

CAPE MAY C. H.—The rainfall has been heavy and almost continuous. The springs are unusually high, some cellars being flooded with water from the rise of the springs. The high average temperature has swollen the buds of nearly all fruit trees. Winter grain and grass are putting on the appearance of spring. How much damage will result from the early development cannot now be determined.

March, 1891.

TEMPERATURE (degrees F.)—The mean temperature for the month, 37.2, is 0.4 above the normal and the mean for the corresponding month of 1890. The chief maxima observed were 68 at Paterson, Passaic county; 65 at Salem, Salem county, Bridgeton, Cumberland county, and South Orange, Essex county; 64 at Beverly and Moorestown, Burlington county, Vineland, Cumberland county, and Trenton, Mercer county. The chief minima observed were 4 at Dover, Morris county, and Pochunk Mt., Sussex county; 6 at Tenafly, Bergen county, Locktown, Hunterdon county, New Brunswick, Middlesex county; 10 at Newark, Essex county; 11 at Allaire, 12 at Asbury Park and Imlaystown, Monmouth county; 13 at Cape May C. H. and Vineland, Cumberland county. The warmest days of the month were the 16th, 23d, 25th, 29th and 30th, and the coldest the 2d, 6th and 15th. The average daily range of temperature determined from self-registering thermometers was 15.2. The greatest being 21.1, at New Brunswick, Middlesex county, and the least 7.8, at Newark, Essex county. The average number of cloudless days was 7 3; partly cloudy 10.1, and cloudy 13.2.

PRECIPITATION (in inches)—The average total precipitation for the month, 5.06, is 1.47 above the normal and 1.02 below the average for the corresponding month of 1890. It was very unevenly distributed, the stations in the extreme southern portion of the State receiving the greatest and those in the northern and central portions the least excess. Only one station reports a deficiency, while remaining stations report an excess (above the average) of from 0.10 to 4.43 inches.

WEATHER AND TEMPERATURE SIGNALS.—The weather predictions for the month have been verified as follows: For weather, 85.0 per cent.; for temperature, 88.0 per cent.; for weather and temperature combined, 86.6 per cent.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.103; maximum observed, 30.59, at New York, on the 2d; minimum observed, 29.48, at Newark and Atlantic City, on the 13th and 22d respectively; range for the State, 1.11.

Temperature (degrees F.)—Monthly mean, 37.2; highest monthly, 42.0, at Readington, Hunterdon county; lowest monthly mean, 34.5, at Newton, Sussex county; maximum, 68, at Paterson, Passaic county, on the 23d and 24th; minimum, 4, at Dover, Morris county, and Pochunk Mt., Sussex county, on the 2d; range for the State, 64; greatest local monthly range, 59, at Dover, Morris county; least local monthly range, 37, at Ocean City, Cape May county; greatest daily range, 38, at Paterson, Passaic county, on the 18th; least daily range, 1, at Newton, Sussex county, and Trenton, Mercer county, on the 5th and 20th respectively.

Precipitation (including melted snow, in inches).—Average for the State, 5.06; greatest, 8.02, at Bridgeton, Cumberland county; least, 2.05, at Paterson, Passaic county; average number of days on which precipitation equaled 0.01 inch, 11.7. *Wind*—Prevailing direction, northeast.

Miscellaneous Phenomena (dates observed)—*Thunder Storms*—Imlaystown, 9th; Tenafly, 9th; Moorestown, 9th; Beverly, 9th; Franklinville, 9th; Salem, 9th; Madison, 9th; Trenton, 9th; New Brunswick, 9th; Lambertville, 9th; Highland Park, 9th; Billingsport, 9th; Camden, 9th; Pochunk Mt., 9th; Oceanic, 9th; Mount Holly, 9th; Bridgeton, 9th; Rancocas, 9th; Dover, 9th; South Orange, 9th; Cape May C. H., 9th; Locktown, 9th. *Solar Halos*—Dover, 2d and 6th; Rancocas, 2d, 6th, 11th, 18th, 24th and 26th; Beverly, 2d, 5th, 11th, 18th, 25th and 26th; Moorestown, 2d and 26th; Imlaystown, 7th; Trenton, 25th and 26th; Salem, 25th; Egg Harbor City, 2d, 6th, 11th, 25th and 26th. *Lunar Halos*—Madison, 15th, 18th and 26th; Salem, 15th and 18th; Trenton, 23d, 24th and 26th; Beverly, 15th, 18th, 25th and 26th; Moorestown, 6th, 15th, 18th and 26th; Imlaystown, 15th, 18th and 26th; Junction, 26th; Highland Park, 18th and 26th; Billingsport, 15th and 18th; Egg Harbor City, 26th; Rancocas, 15th, 18th and 26th. *Sleet*—Pochunk Mt., 8th; Camden, 20th; Highland Park, 4th; Moorestown, 6th. *Meteors*—Madison, 25th; Beverly, 5th; Freehold, 24th.

OBSERVERS' NOTES.

Salem.—At the close of the month the springs are higher than ever known here; ground is thoroughly saturated, the majority of cellars having from one to three feet of water in them. The wet condition of the ground has put farm work back, greatly delaying spring plowing.

Cape May C. H.—Excessive precipitation still continues. No such excess has been experienced since the spring of 1867, when it equaled or exceeded the present. The ground is saturated, low lands submerged, rendering early plowing impracticable. Early truckers very gloomy.

Moorestown.—Robins in flocks, 17th; kingfisher, 19th; killdeer plover, 31st.

Lambertville.—First blackbirds, 9th; robins, 15th; plowing quite general from 27th to 31st.

Freehold.—On the evening of the 24th a brilliant meteor was observed in the northeast. It was brighter than the moon, which was rising at the time, and disappeared just above the horizon.

Pochunk Mt.—The first robins of the season were seen on the 8th. First frogs heard on evening of 23d; on this date the ice in Lake Pochunk broke up.

Dover.—Frost was entirely out of the ground by the end of the month. Bluebirds and robins made their appearance on the 15th. The Morris canal opened for navigation on the 30th. An aurora, a bright, diffused light, was observed in the northeast horizon at 10 P. M. of the 30th.

NEWARK.—The month just closed might be called an average March, with a mean temperature, just a trifle more than one degree below the mean of its forty-seven predecessors, and for that reason the more promising, perhaps, of health, strength and beauty throughout the vegetable kingdom, for nothing therein during the first half of the month was so forward as to receive injury from even the severest winter weather. There was a difference of nearly ten degrees between the temperature of the first fifteen days and that of the last sixteen, the mean of the first fifteen being a trifle above freezing point, while that of the last sixteen was more than ten degrees above that point.

April, 1891.

TEMPERATURE (degrees F.)—The mean temperature for the month, 52.0, is 4.1 above the normal for the month and 1.6 above the mean for the corresponding month of 1890. The chief maxima observed were 88 at Camden, Camden county; 86 at Tenafly, Bergen county; 85 at Paterson, Passaic county, and Lancewood, Ocean county; 84 at Beverly and Moorestown, Burlington county, Bridgeton and Vineland, Cumberland county, and Trenton, Mercer county. The chief minima observed were 20 at Hanover and Dover, Morris county, Tenafly, Bergen county, and Allaire, Monmouth county; 22 at Pochunk Mt., Sussex county, and Paterson, Passaic county; 24 at Egg Harbor City, Atlantic county, and Beverly, Burlington county. The lowest recorded in the extreme southern portion of the State was 30 at Cape May C. H. The warmest days of the month were the 15th, 18th, 19th, 27th, 29th and 30th, and the coldest the 6th, 7th, 8th and 9th. The average daily range of temperature determined from self-registering thermometers was 20.9, an increase of 5.7 over preceding month. The greatest was 29.1, at Tenafly, Bergen county, and the least 13, at Atlantic City, Atlantic county. The average number of cloudless days was 13.4; partly cloudy, 10.7, and cloudy, 5.9.

PRECIPITATION (in inches).—The average precipitation for the month, 2.19, is 1.28 below the normal and 0.46 below the average for the corresponding month of 1890. It is also the smallest average for the month since the establishment of this service. It was very unevenly distributed. Two stations report an amount exceeding three inches; 18 exceeding two, and 14 exceeding one inch. The only stations reporting an excess (above normal) were Paterson, South Orange and Pochunk Mt.

Correction—In Bulletin No. 53, in column of "mean of maximum temperature," the mean for station Dover should read 43.5 instead of 35.5.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.020; maximum observed, 30.560, at New York City, on the 10th; minimum observed, 29.410, at Newark, on the 3d; range for the State, 1.150.

TEMPERATURE (degrees F.)—Monthly mean, 52.0; highest monthly mean, 55.0, at Trenton, Mercer county; lowest monthly mean, 49.0, at Atlantic City, Atlantic county; maximum, 88, at Camden, Camden county, on the 15th; minimum, 20, at Tenafly, Bergen county, on the 7th and 9th; Allaire, Monmouth county, on the 8th; Dover, Morris county, on the 7th, and Hanover, Morris county, on the 8th; range for the State, 68; greatest local monthly range, 66, at Tenafly, Bergen county; least local monthly range, 48, at Newark, Essex county; greatest daily range, 66, at

Tenafly, Bergen county, on the 30th; least daily range, 2, at Asbury Park, Monmouth county, on the 16th.

PRECIPITATION (including melted snow, in inches).—Average for the State, 2.19; greatest, 3.80, at South Orange, Essex county; least, 1.39, at Lambertville, Hunterdon county. Average number of days on which precipitation equaled 0.01 inch, 7.8. *Wind*—Prevailing direction, northwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder Storms*—Camden, 16th and 18th; Ocean City, 16th; Allaire, 16th; Rancocas, 16th and 18th; Moorestown, 15th, 16th, 18th, 22d and 23d; Belleville, 18th, 22d and 23d; Mount Holly, 16th, 18th and 23d; Highland Park, 15th (distant), 16th, 17th; Bridgeton, 11th, 16th; Imlaystown, 18th and 22d; Franklinville, 11th, 18th and 22d; Junction, 17th and 18th; Trenton, 16th, 18th and 22d; Dover, 18th, 22d and 23d, distant on the 14th, 15th and 16th; Billingsport, 16th and 18th; Beverly, 11th, 15th, 16th, 18th and 22d; Cape May C. H., 11th and 23d; Newton, 14th, 16th, 18th and 21st; Tenafly, 14th, 18th, 22d and 23d; Egg Harbor City, 16th, 18th and 23d; Freehold, 17th, 18th and 22d; Pochunk Mt., 14th, distant on the 22d; Philadelphia, 16th and 18th; New York, 18th and 22d. *Solar Halos*—Egg Harbor City, 9th and 10th; Beverly, 5th; Dover, 14th; Rancocas, 5th and 14th. *Lunar Halos*—Rancocas, 22d; Moorestown, 17th; Beverly, 15th and 17th. *Hail*—Newton, 25th; Dover, 4th; Bridgeton, 4th; Vineland, 4th.

OBSERVERS' NOTES.

POCHUNK MT.—The snowfall of the 2d and 3d measured 5.8 inches. The first whip-poor-will was heard on the 20th.

FREEHOLD.—Large flocks of wild geese noticed flying north on the 1st and 2d. Peach trees bloomed on the 19th.

EGG HARBOR CITY.—Peach, pear, cherry and apple trees in bloom on the 16th. A heavy frost on the night of the 26th did much damage to early vegetables and fruit. The damage from the heavy forest fires of the 28th, 29th and 30th will amount to nearly $53,000 in this vicinity.

CAPE MAY C. H.—Fruit and other trees somewhat early in bloom and foliage. Ice in a few localities on the nights of 25th and 26th, but the injury was very slight.

DOVER.—The temperature and precipitation were slightly above the normal for April. Vegetation is progressing favorably.

LANOEWOOD.—No injury from frost during the month. Fruit trees never so full of blossoms. Wild strawberries in bloom on the 15th.

MOORESTOWN.—Migration of birds. Wood pewee, 6th; turtle doves, 14th; bat, 15th; whip-poor-will, 15th; song thrush, 17th; wren and barn swallows, 20th; chimney swallow and sand piper, 22d.

LOCKTOWN.—Rye showing head on the 29th.

NEWARK.—The month just closed gave us a mean temperature of more than two and a half degrees above that of the forty-seven corresponding months immediately preceding it. Its first ten days were, however, very cool, with a mean of only 38.80 degrees. On the morning of the 5th we had ice nearly half an inch thick, the mercury having descended in the early hours to 29 degrees. In fact, it did not rise above 42 degrees during the four successive days, and was twice below the freezing point during that time. To the remaining twenty days, with their mean temperature of more than 57 degrees, we are indebted to an April whose warmth has been equaled but ten times during nearly half a century. The number of its fair days was unusually large. We had but six cloudy afternoons throughout the entire month.

NEW BRUNSWICK.—The month just closed gives us ten clear days, the first pleasant clear day being the 8th. It is true that we had but little rain, the greatest amount falling on any one day being 0.60 of an inch, which occurred on the 2d, between the hours of 4 and 9 P. M. It was cloudy and threatening many days, while the stars generally made their appearance at night. The rains of April generally come in showers, and are greeted as the predecessors of a plentiful harvest, the old saying, "April showers make May flowers," but during the last month we had but two thunder showers, one on the 16th, at 10 P. M., when but .04 of an inch of water fell, and the other on the 18th, at 9 P. M., with but .02 inches falling.

May, 1891.

TEMPERATURE (degrees F.)—The mean temperature for the month, 59.5, is 0.2 below the normal for the month, and 1.2 below the average for the corresponding month of 1890. The chief maxima observed were 93, at New Brunswick, Middlesex county; 92, at Moorestown, Burlington county, Imlaystown, Monmouth county, and Lancewood, Ocean county; 91, at Dover, Morris county, Woodbury, Gloucester county, Beverly, Burlington county, and Tenafly, Bergen county; 90 at Egg Harbor City, Atlantic county, Camden, Camden county, Highland Park, Middlesex county, Freehold, Monmouth county, and Somerville, Somerset county. The chief minima observed were 24, at Allaire, Monmouth county; 26, at Somerville, Somerset county; 28, at Lancewood, Ocean county, Dover, Morris county, Franklinville, Gloucester county; 29, at Egg Harbor City, Atlantic county, and Vineland, Cumberland county, Pochunk Mt., Sussex county, and Blairstown, Warren county. The warmest days of the month were the 9th, 10th, 11th, 21st and 22d. The coldest days were the 6th and 7th The average daily range of temperature determined from self-registering thermometers was 21.3, the greatest being 29.9, at Tenafly, Bergen county, and the least, 12.4, at Atlantic City, Atlantic county.

PRECIPITATION (in inches)—The average total precipitation for the month, 2.97, is 0.77 below the normal and 1.27 below the average for the corresponding month of 1890. Like the previous month the rainfall was very unequally distributed, the stations in Monmouth county, bordering on the sea-coast, receiving the largest (about five inches), and those in Burlington and the southeastern portion of Hunterdon county receiving the least amounts (less than two inches). The average number of cloudless days was 8.9; partly cloudy, 11.5, and cloudy, 11.0.

WEATHER AND TEMPERATURE SIGNALS.—The weather predictions for the month have been verified as follows: For weather, 79.3 per cent.; for temperature, 90.3 per cent.; for weather and temperature combined, 84.8 per cent.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.041. Maximum observed, 30.470, at Atlantic City, on the 20th. Minimum observed, 29.740, at New York City, on the 1st. Range for the State, 0.730.

TEMPERATURE (degrees F.)—Monthly mean, 59.5. Highest monthly mean, 62.3 at Bridgeton, Cumberland county, and Woodbury, Gloucester county. Lowest monthly mean, 56 6, at Pochunk Mt. (Deckertown), Sussex county. Maximum, 93, at New Brunswick, Middlesex county, on the 11th. Minimum, 24, at Allaire, Monmouth county, on the 6th. Range for the State, 69. Greatest local monthly range, 64, at Lancewood, Ocean county, and Somerville, Somerset county. Least local monthly range, 46, at Oceanic, Monmouth county. Greatest daily range, 48, at Tenafly, Bergen county, on the 9th. Least daily range, 1, at Gillette, Morris county.

PRECIPITATION (including melted snow, in inches).—Average for the State, 2.97. Greatest, 5.39, at Oceanic, Monmouth county. Least, 1.78, at Mount Holly, Burlington county. Average number of days on which precipitation equaled 0.01 inch, 9. *Wind*—Prevailing direction, southwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder Storms*—Moorestown, 11th, 20th, 21st, 22d and 31st; Cape May C. H., 11th and 22d; Highland Park, 12th, 20th, 22d, 31st; Woodbury, 12th, 20th, 22d, 31st; Camden, 11th, 20th, 22d; Billingsport, 20th; Bridgeton, 22d; Beverly, 11th, 20th, 31st; Allaire, 16th, 22d; Dover, 11th, 20th, 22d; Junction, 20th; Imlaystown, 22d, 31st; Blairstown, 31st; Rancocas, 20th; Trenton, 20th, 22d; Tenafly, 11th; Oceanic, 20th, 22d, 29th; Egg Harbor City, 3d, 6th, 15th 22d. *Solar Halos*—Oceanic, 14th, 27th, 28th; Trenton, 8th; Rancocas, 6th, 27th, 28th; Pochunk Mt., 27th; Dover, 2d, 27th; Woodbury, 13th; Moorestown, 14th; New York City, 23d, 27th, 28th. *Lunar Halos*—Pochunk Mt., 13th; New York City, 14th, 17th, 21st, 22d, 28th. *Meteors*—Pochunk Mt., observed at midnight on the 20th; very large and brilliant, of varied colors.

June, 1891.

TEMPERATURE (degrees F.)—The mean temperature for the month of June, 1891, 69.7, is 0.3 below the normal and 1.0 below the average for the corresponding month of 1890. The chief maxima observed were 102 at Tenafly, Bergen county; 101 at Somerville, Somerset county; 100 at New Brunswick, Middlesex county, and 98 at Imlaystown, Monmouth county. The chief minima observed were 38 at Hanover, Morris county; 40 at Blairstown, Warren county, Gillette, Morris county, and Allaire, Monmouth county; 41 at Franklinville, Gloucester county, Vineland, Cumberland county, and Cape May C. H., Cape May county. The warmest days were the 16th, 17th and 26th. The coolest the 5th, 6th, 7th and 8th. The average daily range of temperature, determined from self-registering thermometers, was 22.3, the greatest being 29.7, at Tenafly, Bergen county, and the least 12.8, at Asbury Park, Monmouth county.

PRECIPITATION (in inches).—The average total precipitation for the month, 2.92 inches, is 1.06 below the normal and 0.67 below the average for the corresponding month of 1890. The stations receiving the largest amount were Imlaystown, Monmouth county, 6.71; Beverly, Burlington county, 5.81, and Freehold, Monmouth county, 5.33. These stations report an amount exceeding the average: Imlaystown, Beverly, Freehold, Lancewood, Camden, Bridgeton and Asbury Park. The stations receiving the least amount were: Cape May C. H., 1.24; New Brunswick, 1.62; Hanover, 1 37; Pochunk Mt., 1.36; Oceanic, 1.45; Atlantic City, 1.67; South Orange, 1.78, and New York City, 1.18. The average number of cloudless days was 13.6; partly cloudy, 9.0, and cloudy, 7.5.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 29.964. Maximum observed, 30.230, at Atlantic City on the 9th. Minimum observed, 29.730, at Philadelphia on the 17th. Range for the State, 0.500.

TEMPERATURE (degrees F.)—Monthly mean, 69.7. Highest monthly mean, 74.0, at Trenton, Mercer county; lowest monthly mean, 66.1, at Atlantic City, Atlantic county; maximum, 102, at Tenafly, Bergen county, on the 16th; minimum, 38, at Hanover, Morris county, on the 8th; range for the State, 64; greatest local monthly range, 59, at Tenafly, Bergen county; least local monthly range, 42, at Asbury Park, Monmouth county; greatest daily range, 46, at Hanover, Morris county, on the 15th; least daily range, 0, at Lambertville, Hunterdon county, on the 18th.

PRECIPITATION.—Average for the State, 2.92; greatest, 6.71, at Imlaystown, Monmouth county; least, 1.24, at Cape May C. H.; average number of days on which precipitation equaled 0.01 inch, 5.1. Prevailing direction of the wind, southwest.

MISCELLANEOUS PHENOMENA (dates observed).—*Thunder Storms*—Imlaystown, 17th, 21st, 26th (2); Oceanic, 2d, 16th and 17th; Tenafly, 26th; Bridgeton, 21st, 22d; Locktown, 16th, 17th, 21st; Moorestown, 12th, 17th, 21st, 26th; Ocean City, 17th; Cape May C. H., 12th, 26th Readington, 16th, 17th; Trenton, 17th, 21st; Billingsport, 17th, 21st; Junction, 2d, 16th, 17th, 21st; Dover, 2d, 16th, 22d; Rancocas, 17th, 26th; New Brunswick, 16th, 17th, 21st; Camden, 17th, 21st, 26th; Beverly, 2d, 11th, 16th, 21st, 22d, 26th; Egg Harbor City, 1st, 12th, 17th, 21st, 26th; Woodbury, 17th, 21st, 22d, 26th; *Solar Halos*—Rancocas, 11th; Oceanic, 11th; Moorestown, 11th. *Polar Bands*—Moorestown, 27th.

NUMBER OF MARRIAGES, BIRTHS AND DEATHS,

BY COUNTIES, CITIES AND TOWNSHIPS, AND TOTALS FOR THE STATE, FOR THE YEAR ENDING JUNE 30TH, 1891.

ATLANTIC COUNTY.

	M.	B.	D.
Absecon, Town of	5	8	10
Atlantic City	197	313	283
Buena Vista	6	9	7
Egg Harbor City	25	52	34
Egg Harbor Township	26	60	62
Galloway	10	40	24
Hamilton	11	35	23
Hammonton	27	85	68
Mullica	2	9	13
Weymouth	1	5	1
	310	616	525

BERGEN COUNTY.

	M.	B.	D.
Boiling Spring	4	23	26
Englewood	45	47	96
Franklin	27	41	34
Harrington	24	25	46
Hohokus	15	42	48
Lodi	48	134	82
Midland	6	38	28
New Barbadoes	47	150	91
Orvil	7	28	26
Palisade	10	34	39
Ridgefield	21	78	90
Ridgewood	11	24	28
Saddle River	6	35	34
Union	28	59	54
Washington	16	72	52
	315	830	774

BURLINGTON COUNTY.

	M.	B.	D.
Bass River	8	19	19
Beverly	24	23	39
Bordentown	39	96	88
Burlington	82	116	151
Chester	15	71	62
Chesterfield	16	12	15
Cinnaminson	29	53	51
Delran	18	33	36
Eastampton	....	7	13
Evesham	10	22	22
Florence	5	37	28
Little Egg Harbor	11	40	20
Lumberton	1	15	12
Mansfield	9	34	26
Medford	7	32	34
Mount Laurel	1	22	10
New Hanover	30	26	27
Northampton	47	110	126
Pemberton	17	14	31
Randolph	5	4	4
Shamong	3	16	9
Southampton	11	14	9
Springfield	3	15	14
Washington	....	11	4
Westampton	1	1	10
Willingboro	....	8	5
Woodland	....	....	2
	392	855	867

CAMDEN COUNTY.

	M.	B.	D.
Camden City	*3,939	1,276	1,407
Center	5	58	45
Delaware	2	18	20
Gloucester City	50	114	146
Gloucester	6	72	82
Haddon	33	92	54
Stockton	51	132	144
Waterford	13	75	35
Winslow	5	55	30
	4,104	1,892	1,963

* Marriages of non-residents, 3,078.

CAPE MAY COUNTY.

	M.	B.	D.
Cape May City	23	51	35
Dennis	22	31	33
Lower	15	39	31
Middle	10	51	36
Upper	15	40	35
	85	212	170

CUMBERLAND COUNTY.

	M.	B.	D.
Bridgeton	116	315	223
Commercial	26	37	8
Deerfield	12	26	33
Downe	18	19	9
Fairfield	5	35	21
Greenwich	5	8	19
Hopewell	11	18	37
Landis	79	168	116
Lawrence	5	28	28
Maurice River	7	38	39
Millville	85	253	170
Stoe Creek	6	5	16
	375	950	719

ESSEX COUNTY.

	M.	B.	D.
Belleville	16	36	63
Bloomfield	41	187	115
Caldwell	18	89	42
Clinton	18	60	40
East Orange	103	267	189
Franklin	13	46	23
Livingston	3	15	11
Millburn	3	52	41
Montclair	52	212	121
Newark	1,704	4,810	4,420
Orange	173	485	397
South Orange	24	68	63
West Orange	15	59	65
	2,183	6,386	5,590

GLOUCESTER COUNTY.

	M.	B.	D.
Clayton	22	16	34
Deptford	7	45	30
East Greenwich	6	14	19
Franklin	12	37	22
Glassboro	22	74	33
Greenwich	9	32	31
Harrison	9	34	25
Logan	6	23	15
Mantua	22	26	32
Monroe	30	40	38
South Harrison	7	15	8
Washington	9	35	21
West Deptford	4	31	18
Woodbury	50	106	63
Woolwich	16	52	40
	231	580	429

HUDSON COUNTY.

	M.	B.	D.
Bayonne	117	510	412
Guttenberg	23	88	53
Harrison	34	249	274
Hoboken	447	1,806	1,189
Jersey City	1,187	3,140	4,386
Kearny	19	182	171
North Bergen	26	86	262
Town of Union	120	168	289
Union	7	58	42
Weehawken	6	27	50
West Hoboken	90	328	271
	2,076	6,187	7,349

HUNTERDON COUNTY.

	M.	B.	D.
Alexandria	5	10	17
Bethlehem	7	36	36
Clinton	18	34	19
Delaware	13	41	47
East Amwell	16	16	16
Franklin	13	20	19
Frenchtown	10	15	16
High Bridge	21	31	27
Holland	19	12	26
Kingwood	8	15	18
Lambertville	54	77	87
Lebanon	30	48	34
Raritan	24	35	49
Readington	25	17	50
Tewksbury	27	24	21
Union	7	15	17
West Amwell	2	12	16
	299	458	515

MERCER COUNTY.

	M.	B.	D.
East Windsor	37	88	88
Ewing	7	19	96
Hamilton	18	33	95
Hopewell	24	45	66
Lawrence	7	18	20
Princeton	30	68	78
Trenton	*642	667	929
Washington	3	1	19
West Windsor	10	14	15
	778	898	1,858

* Marriages of non-residents, 88.

MIDDLESEX COUNTY.

	M.	B.	D.
Cranbury	9	23	26
East Brunswick	24	46	35
Madison	5	20	12
Monroe	6	39	33
New Brunswick	187	294	327
North Brunswick	11	28	17
Perth Amboy	38	180	234
Piscataway	27	53	56
Raritan	24	49	70
Sayreville	27	60	42
South Amboy	25	83	75
South Brunswick	16	47	43
Woodbridge	10	101	84
	409	1,023	1,054

MONMOUTH COUNTY.

	M.	B.	D.
Atlantic	2	15	23
Eatontown	15	24	36
Freehold	46	106	90
Holmdel	12	18	26
Howell	41	62	35
Long Branch	75	125	98
Manalapan	16	16	19
Marlboro	8	11	23
Matawan	22	60	74
Middletown	32	98	103
Millstone	6	25	24
Neptune	129	109	190
Ocean	4	5	12
Raritan	41	98	62
Shrewsbury	72	111	155
Upper Freehold	29	55	48
Wall	38	101	83
	588	1,039	1,101

MORRIS COUNTY.

	M.	B.	D.
Boonton	25	27	32
Chatham	32	61	30
Chester	6	29	32
Hanover	23	54	129
Jefferson	14	26	23
Mendham	9	19	14
Montville	8	6	24
Morristown	62	194	185
Mount Olive	11	29	31
Passaic	12	14	32
Pequannock	17	62	37
Randolph	57	147	119
Rockaway	40	106	78
Roxbury	14	68	54
Washington	9	40	32
	339	882	852

HUDSON COUNTY.

	M.	B.	D.
Bayonne	117	510	412
Guttenberg	23	88	53
Harrison	34	249	274
Hoboken	447	1,306	1,139
Jersey City	1,187	3,140	4,386
Kearny	19	182	171
North Bergen	26	86	262
Town of Union	120	168	289
Union	7	58	42
Weehawken	6	27	50
West Hoboken	90	328	271
	2,076	6,137	7,349

HUNTERDON COUNTY.

	M.	B.	D.
Alexandria	5	10	17
Bethlehem	7	36	36
Clinton	18	34	19
Delaware	18	41	47
East Amwell	16	16	16
Franklin	13	20	19
Frenchtown	10	15	16
High Bridge	21	31	27
Holland	19	12	26
Kingwood	8	15	18
Lambertville	54	77	87
Lebanon	30	48	34
Raritan	24	35	49
Readington	25	17	50
Tewksbury	27	24	21
Union	7	15	17
West Amwell	2	12	16
	299	453	515

MERCER COUNTY.

	M.	B.	D.
East Windsor	37	33	38
Ewing	7	19	98
Hamilton	13	33	95
Hopewell	24	45	66
Lawrence	7	18	20
Princeton	30	68	78
Trenton	*642	667	929
Washington	8	1	19
West Windsor	10	14	15
	778	898	1,358

* Marriages of non-residents, 38.

MIDDLESEX COUNTY.

	M.	B.	D.
Cranbury	9	23	26
East Brunswick	24	46	35
Madison	5	20	12
Monroe	6	39	33
New Brunswick	187	294	327
North Brunswick	11	28	17
Perth Amboy	38	180	234
Piscataway	27	53	56
Raritan	24	49	70
Sayreville	27	60	42
South Amboy	25	83	75
South Brunswick	16	47	43
Woodbridge	10	101	84
	409	1,023	1,054

MONMOUTH COUNTY.

	M.	B.	D.
Atlantic	2	15	23
Eatontown	15	24	36
Freehold	46	106	90
Holmdel	12	18	26
Howell	41	62	85
Long Branch	75	125	98
Manalapan	16	16	19
Marlboro	8	11	23
Matawan	22	60	74
Middletown	32	98	103
Millstone	6	25	24
Neptune	129	109	190
Ocean	4	5	12
Raritan	41	98	62
Shrewsbury	72	111	155
Upper Freehold	29	55	43
Wall	38	101	38
	588	1,039	1,101

MORRIS COUNTY.

	M.	B.	D.
Boonton	25	27	82
Chatham	32	61	30
Chester	6	29	32
Hanover	23	54	129
Jefferson	14	26	23
Mendham	9	19	14
Montville	8	6	24
Morristown	62	194	135
Mount Olive	11	29	31
Passaic	12	14	32
Pequannock	17	62	37
Randolph	57	147	119
Rockaway	40	106	78
Roxbury	14	68	54
Washington	9	40	32
	339	882	852

OCEAN COUNTY.

	M.	B.	D.
Berkeley	1	12	13
Brick	37	77	71
Dover	28	64	37
Eagleswood	7	13	20
Jackson	19	19	21
Lacey	5	11	10
Manchester	7	17	15
Ocean	....	9	4
Plumsted	8	26	11
Stafford	11	12	27
Union	14	22	13
	137	282	242

PASSAIC COUNTY.

	M.	B.	D.
Acquackanonk	10	22	34
Little Falls	11	59	31
Manchester	5	47	32
Passaic	91	352	332
Paterson	778	2,040	1,867
Pompton	28	45	25
Wayne	10	26	24
West Milford	14	14	42
	937	2,605	2,387

SALEM COUNTY.

	M.	B.	D.
Alloway	14	20	27
Elsinboro	1	1	9
Lower Alloways Creek	15	22	20
Lower Penns Neck	7	17	15
Mannington	4	9	29
Oldmans	6	32	14
Pilesgrove	14	49	70
Pittsgrove	6	83	35
Quinton	7	28	25
Salem	59	95	93
Upper Penns Neck	30	52	22
Upper Pittsgrove	15	24	15
	178	432	374

SOMERSET COUNTY.

	M.	B.	D.
Bedminster	7	33	32
Bernards	15	26	29
Branchburg	2	11	19
Bridgewater	74	182	180
Franklin	22	51	75
Hillsborough	11	27	45
Montgomery	7	13	26
North Plainfield	27	78	57
Warren	6	4	17
	171	425	490

SUSSEX COUNTY.

	M.	B.	D.
Andover	6	14	16
Byram	9	33	11
Frankford	8	20	32
Green	7	19	18
Hampton	2	9	9
Hardyston	22	4	32
Lafayette	11	10	15
Montague	....	2	7
Newton	31	37	38
Sandyston	8	11	15
Sparta	15	15	27
Stillwater	8	14	5
Vernon	6	16	16
Walpack	....	2	12
Wantage	26	35	47
	159	241	300

UNION COUNTY.

	M.	B.	D.
Clark	....	2	3
Cranford	....	2	16
Elizabeth	333	975	755
Fanwood	8	13	16
Linden	9	11	35
New Providence	2	13	21
Plainfield	92	230	193
Rahway	77	70	126
Springfield	9	28	14
Summit	16	50	46
Union	4	19	33
Westfield	18	46	48
	568	1,459	1,306

WARREN COUNTY.

	M.	B.	D.
Allamuchy	....	10	8
Belvidere	28	35	22
Blairstown	11	29	18
Franklin	12	18	18
Frelinghuysen	4	10	9
Greenwich	12	17	18
Hackettstown	24	32	42
Hardwick	2	8	7
Harmony	7	22	13
Hope	6	16	12
Independence	18	18	9
Knowlton	122	24	18
Lopatcong	....	39	18
Mansfield	12	20	25
Oxford	81	95	78
Pahaquarry	....	2	3
Phillipsburg	*328	172	138
Pohatcong	7	40	24
Washington	52	78	65
	671	685	585

* Marriages of non-residents, 250.

TOTALS OF MARRIAGES, BIRTHS AND DEATHS FOR ALL THE COUNTIES.

	M.	B.	D.
Atlantic	310	616	525
Bergen	315	830	774
Burlington	392	855	867
Camden	4,104	1,392	1,968
Cape May	85	212	170
Cumberland	375	950	719
Essex	2,188	6,886	5,590
Gloucester	231	580	429
Hudson	2,076	6,187	7,349
Hunterdon	299	453	515
Mercer	778	898	1,358
Middlesex	409	1,023	1,054
Monmouth	588	1,039	1,101
Morris	389	882	852
Ocean	187	282	242
Passaic	937	2,605	2,387
Salem	178	432	374
Somerset	171	425	430
Sussex	159	241	300
Union	568	1,459	1,306
Warren	671	685	585
	15,305	28,832	28,340

RETURNS OF DEATHS FROM ALL CAUSES.

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891, by Counties.

COUNTIES. Statistical Divisions.	DEATHS AT ALL AGES.													PRINCIPAL CAUSES OF DEATHS.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population of 1891.*	Death-rate per 1,000.	Death-rate per 1,000 without cities of over 5,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic	130	62	50	150	130	3	525	30,132	17.42	14.76	36.57	194	36.95	......	9	3	5	5	29	2	66	37	38	57	26	35	18	46	23	18	5	3	30
Bergen	166	60	65	252	228	3	774	48,695	15.90	....	29.19	229	29.59	4	16	4	4	10	24	1	83	40	43	141	40	51	39	82	33	19	4	19	46
Burlington	165	89	87	250	270	6	867	58,722	14.76	13.33	29.30	287	33.10	5	30	11	......	14	44	2	75	60	46	110	40	63	41	76	57	30	8	10	40
Camden	517	292	230	547	365	12	1,963	89,887	21.84	17.22	41.21	811	41.31	11	53	22	......	32	216	4	265	95	113	168	165	120	61	132	100	48	3	15	89
Cape May	34	9	16	49	59	3	170	11,372	14.95	....	25.29	55	32 35	1	3	2	1	1	10	1	18	10	8	6	8	10	9	32	19	6	1	......	7
Cumberland	141	95	93	174	209	7	719	46,129	15.59	13.27	32.82	274	38.11	3	23	5	1	5	78	2	64	51	42	66	45	68	28	64	41	20	1	8	28
Essex	1432	668	448	1957	1074	11	5,590	264,564	21.13	13.24	37.57	2,060	36.85	39	163	50	22	61	273	19	629	465	339	762	440	354	252	420	293	120	10	52	212
Gloucester	113	38	48	99	129	2	429	28,858	14.86	....	35.20	132	30.77	......	13	5	......	3	19	1	46	24	21	43	28	34	19	42	23	9	2	2	23
Hudson	1884	1244	644	2560	1004	13	7,349	282,082	26.05	26.21	42.56	2,725	37.08	56	211	105	114	42	556	26	797	460	358	1253	661	380	279	412	369	119	7	77	378
Hunterdon	86	28	28	141	231	1	515	35,355	14.57	....	22.14	140	27.18	1	12	3	4	1	16	1	40	35	27	63	14	50	32	89	36	21	1	5	12
Mercer	308	168	112	417	339	14	1,358	82,616	16.44	18.88	35.05	467	34.39	7	29	13	8	17	69	6	147	94	77	145	79	86	76	161	65	33	......	18	60
Middlesex	227	126	85	322	280	14	1,054	62,868	16.77	14.48	33.49	349	33.11	14	26	11	16	24	41	3	114	48	52	169	51	80	56	89	53	27	5	15	55
Monmouth	270	98	77	309	340	7	1,101	70,488	15.62	16 04	33.42	366	32.24	6	22	2	4	10	32	2	153	64	71	144	53	92	40	115	72	25	3	8	56
Morris	156	69	49	274	297	7	852	54,766	15.56	15.38	27.58	218	25.59	6	8	5	11	7	18	1	62	40	60	112	43	81	32	142	47	22	5	9	40
Ocean	34	26	21	69	90	2	242	16,061	15.07	....	24.79	80	33.06	......	3	4	1	5	7	1	31	17	11	20	7	26	8	24	21	8	5	1	18
Passaic	620	405	237	702	418	5	2,387	109,380	21.82	13.38	42.94	908	38.04	8	31	25	42	26	206	7	287	145	131	411	172	160	73	118	126	47	3	19	115
Salem	87	32	24	90	139	2	374	25,151	14.57	14.46	31.82	117	31.28	1	6	2	......	4	8	...	47	22	27	37	12	40	18	44	32	12	1	4	9
Somerset	78	20	28	124	177	3	430	28,488	15.09	....	22.79	116	26.98	4	8	4	3	3	6	1	37	25	25	64	12	47	21	53	34	9	1	6	25
Sussex	45	21	23	77	128	6	300	22,259	13.48	....	21.67	78	26.00	2	6	......	1	1	6	...	33	13	16	53	10	37	13	39	19	8	1	7	9
Union	337	147	96	421	302	3	1,306	74,592	17.51	13.50	37.06	419	32.08	11	14	10	3	19	69	5	135	83	70	208	96	99	53	107	68	23	8	10	83
Warren	105	54	47	148	179	2	535	36,319	14 73	14.41	29.72	156	29.16	1	9	2	10	9	10	...	62	21	32	69	27	46	32	46	42	18	2	8	30
Totals	6935	3751	2508	9132	6388	126	28,840	1478,784	19 50	15.41	37.05	10,181	35 30	180	695	288	250	299	1737	85	3191	1849	1607	4101	2029	1960	1200	2333	1573	642	76	296	1365

* The population is estimated upon the increase from the State Census of 1885 to the National Census of 1890. Where there was a decrease the population of 1890 is given.

NOTE.—Small-pox is omitted in the tables, because no cases were reported up to July 1st, 1891.

NOTE.—Under the heading "Number of deaths from chief preventable diseases," the first eleven diseases are classified, including consumption, male and female. Of those dying under one year, 2,075 died under one month, of which 1,421 died in the large cities Of those dying under one year, 4,831 died in the large cities. Of the 10,686 that died under five years, 7,704 died in the large cities. Total death-rate from consumption for the State, as compared with the total deaths, 11.98: the deaths being 2,314 in cities, 1,142 outside. Rates for short periods, or which deal with small numbers, are only approximate, since temporary causes may have been in operation, and small numbers do not eliminate or balance errors, which practically disappear in larger aggregates. The number of deaths before twenty, in proportion to the rest, is much more informatory as to local causes affecting health than the total deaths. See, also, number dying from preventable diseases.

Return of Deaths from all Causes and Certain Specified Diseases, in the Cities of the State of New Jersey of Over 5,000 Population, for the Year Ending June 30th, 1891.

CITIES HAVING OVER 5,000 POPULATION. Statistical Divisions.	DEATHS AT ALL AGES.												PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1891.	Death-rate per 1,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic County.																																
Atlantic City	*77	38	25	96	51	1	288	14,077	†20.46	39.93	99	34.38	......	7	1	1	4	15	2	42	12	15	32	16	24	11	24	14	9	1	2	19
Burlington County.																																
Bordentown	12	9	5	26	34	2	88	4,232	20.79	23.86	24	27.27	......	2	2	......	2	2	...	6	6	4	6	8	10	6	7	7	2	1	......	9
Burlington	21	17	19	53	41	......	151	7,386	20.44	25.17	50	33.11	......	7	......	......	1	10	1	7	15	9	19	12	15	12	8	7	3	2	2	8
Camden County.																																
Camden City	369	239	175	389	229	6	1,407	59,398	23.68	43.21	631	44.85	9	33	19	......	24	192	3	197	67	87	118	121	79	43	81	60	35	3	14	51
Gloucester City	40	16	14	45	30	1	146	6,683	21.85	38.36	53	36.30	......	5	......	......	5	5	...	20	8	10	14	7	9	5	9	10	3	...	......	15
Cumberland County.																																
Bridgeton	51	35	44	41	52	5	222	11,695	19.50	37 72	98	42.98	2	8	5	......	2	40	1	19	7	14	18	14	21	8	18	9	8	...	3	8
Millville	39	32	23	42	33	1	170	10,237	16.61	41.76	88	51.76	......	10	......	1	1	27	...	20	17	12	14	11	11	8	13	5	2	1	......	5
Essex County.																																
Newark	1156	545	338	1586	787	8	4,420	186,598	23.69	38.45	1,643	37.17	32	184	45	15	52	196	12	523	366	268	597	370	264	185	332	242	98	6	37	181
Orange	85	67	43	146	55	1	397	19,566	20.29	38.29	161	40.55	1	9	3	2	2	41	2	33	45	23	66	28	19	24	24	9	5	...	3	9
Hudson County.																																
Bayonne	139	60	37	124	52	......	412	20,228	20.37	48.30	140	33.98	2	7	11	3	1	14	2	62	22	16	60	48	15	15	19	27	1	...	3	27
Harrison	76	44	17	104	33	......	274	8,644	31.70	43.80	88	32.12	7	2	3	8	5	10	...	31	13	9	50	35	12	8	18	21	3	...	2	15
Hoboken	305	186	83	404	158	3	1,139	44,833	25.41	43.11	423	37.14	2	14	10	14	4	93	4	140	92	50	184	95	75	42	70	52	20	...	9	65
Jersey City	1068	709	418	1618	567	6	4,386	164,901	26.60	40.52	1,571	35.82	33	167	63	70	28	295	14	407	272	232	794	395	280	174	203	223	82	6	54	224
Town of Union	74	84	31	62	38	......	289	11,092	26.06	54.67	145	60.17	3	5	10	5	......	53	2	44	12	11	38	25	10	11	13	14	3	1	3	2
Mercer County.																																
Trenton	247	153	88	261	169	11	929	59,896	15.51	43.06	348	36.92	3	16	18	7	10	67	2	116	69	41	104	67	44	48	79	40	28	...	12	36

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* Probably due to infants brought to the city sick.

† This death-rate is calculated on the resident population, whereas the real population is often several times larger, and on account of this floating population, the death-rate is not a criterion of health conditions.

Return of Deaths from all Causes and Certain Specified Diseases, in the Cities of the State of New Jersey, of Over 5,000 Population, for the Year Ending June 30th, 1891.

CITIES HAVING OVER 5,000 POPULATION.	DEATHS AT ALL AGES.												PRINCIPAL CAUSES OF DEATH.																			
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1891.	Death-rate per 1,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Middlesex County.																																
New Brunswick......	52	38	21	112	96	8	327	18,672	17.51	27.52	98	29.97	3	6	4	7	8	5	1	26	21	17	65	15	29	24	29	15	12	2	6	11
Perth Amboy...........	68	49	28	62	27	......	234	10,152	23.06	50.00	99	42.81	5	9	1	2	2	29	...	38	6	7	37	14	8	11	7	8	......	...	3	15
Monmouth County.																																
Long Branch...........	16	9	5	31	26	3	93	7,649	12.16	26.88	31	33.33	......	1	......	......	......	6	...	7	9	8	8	4	14	......	10	4	1	...	2	10
Morris County.																																
Morristown...............	14	10	7	44	58	2	135	8,156	16.55	17.78	36	26.67	......	1	......	......	.. ...	5	...	10	7	13	16	3	13	5	24	9	4	3	3	5
Passaic County.																																
Passaic City.............	99	71	34	81	47	......	332	13,968	23.77	51.21	135	40.66	2	11	......	10	......	32	...	52	21	7	57	31	18	6	13	19	8	...	1	14
Paterson....................	475	310	186	571	322	3	1,867	81,361	22.95	42.04	715	38.30	3	17	22	81	26	161	7	217	113	118	333	123	124	63	91	93	38	2	14	87
Salem County.																																
Salem City................	21	8	3	22	39	....	93	5,516	16.86	31.18	23	24 73	......	3	......	......	1	......	...	10	6	3	9	6	12	1	13	10	4	...	......	2
Union County.																																
Elizabeth...................	221	102	52	251	129	......	755	38,893	19.41	42.78	240	31.79	5	5	4	......	15	51	3	79	42	36	138	59	43	26	60	32	9	4	7	50
Plainfield..................	47	20	15	61	63	2	198	11,737	16.87	33.84	63	31.82	1	3	5	2	4	4	...	24	8	12	27	11	22	10	22	9	4	2	2	10
Rahway......................	27	8	16	36	39	......	126	7,153	17.61	27.78	41	32 54	1	2	......	1	......	4	1	12	11	9	16	14	12	10	10	4	3	...	......	10
Warren County.																																
Phillipsburg.............	32	14	14	44	34	......	138	8,761	15.75	33.33	47	34.06	......	4	1	4	1	2	...	19	5	11	13	9	8	7	6	14	6	...	2	11
Totals..................	4831	2873	1741	6315	3199	63	19,022	811,479	22.37	40.50	7,095	37.30	114	487	222	188	198	1359	57	2161	1272	1042	2828	1539	1141	758	1205	957	391	34	184	898

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1891.

ATLANTIC COUNTY. Population, 30,132. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases	Digestive and intestinal diseases	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Absecon	4	......	......	3	3	......	10	....	....	......	......	......	......	......	......	......	3	2	2	2	......	......	......	......	......	......	......	......	......
*Atlantic City	77	38	25	96	51	1	288	14,077	20.46	......	7	1	1	4	15	2	42	12	15	32	16	24	11	24	14	9	1	2	19
Buena Vista	7	......	......	......	......	......	7	....	....	......	......	......	1	......	1	......	1	......	......	......	......	......	......	......	......	......	......	......	......
Egg Harbor City	8	......	8	6	12	......	34	....	....	......	......	......	......	......	4	......	2	5	1	4	4	2	......	4	......	......	1	......	2
Egg Harbor Township	13	6	3	17	22	1	62	....	....	......	......	......	......	......	2	......	9	6	8	6	3	4	1	8	4	1	......	......	3
Galloway	3	3	3	5	10	......	24	....	....	......	1	......	......	......	1	......	3	......	4	2	1	1	......	1	......	3	2	1	2
Hamilton	4	5	2	3	9	......	23	....	....	......	......	1	......	......	3	......	1	3	1	2	1	......	......	2	2	3	......	......	......
Hammonton	11	8	9	18	16	1	63	....	....	......	1	1	3	......	2	......	3	8	5	9	1	4	6	4	2	1	1	......	4
Mullica	3	2	......	2	6	......	13	....	....	......	......	......	......	1	1	......	2	1	2	......	......	......	......	2	1	1	......	......	......
Weymouth	......	......	......	......	1	......	1	....	....	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1	......	......	......	......	......
Totals	**130**	**62**	**50**	**150**	**130**	**3**	**525**	**30,132**	**17.42**	**......**	**9**	**3**	**5**	**5**	**29**	**2**	**66**	**37**	**38**	**57**	**26**	**35**	**18**	**46**	**23**	**18**	**5**	**3**	**30**

*** This and all other cities that are health resorts have an excessive death-rate by reason of temporary increase of population, which also includes a proportion of invalids above the average. Local Boards show this on their record.**

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1891.

BERGEN COUNTY. Population, 48,696. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Boiling Spring	8	1	3	9	5	......	26	....	....	......	......	......	......	......	......	......	5	3	......	3	3	2	......	2	......	......	......	1	5
Englewood	20	11	8	39	18	......	96	....	....	2	6	......	1	......	4	......	8	2	7	19	9	6	1	4	4	6	......	7	4
Franklin	7	2	1	8	16	......	34	....	....	......	......	......	......	2	2	......	3	......	......	4	......	5	......	7	3	1	......	1	2
Harrington	4	2	6	16	18	......	46	....	....	1	2	......	1	......	......	......	2	1	4	16	2	2	3	6	1	1	......	1	3
Hohokus	11	3	4	10	20	......	48	....	....	......	1	......	1	1	1	......	5	2	4	10	2	7	2	8	1	......	1	1	2
Lodi	25	10	5	24	18	......	82	....	....	......	1	1	1	1	3	......	11	3	4	20	7	6	5	5	1	......	1	1	5
Midland	5	2	1	11	9	......	28	....	....	......	1	......	......	......	......	......	2	1	1	3	1	1	4	7	......	1	......	......	1
New Barbadoes	15	8	10	29	29	......	91	....	....	......	......	......	......	1	4	......	9	5	4	12	4	8	8	12	5	1	1	3	5
Orvil	4	......	3	7	12	......	26	....	....	......	......	......	......	......	2	......	1	2	1	7	......	3	3	3	1	......	......	......	......
Palisade	6	2	2	16	13	......	39	....	....	......	......	......	......	......	2	......	5	3	8	7	......	1	4	7	1	......	......	2	3
Ridgefield	16	8	10	34	22	......	90	....	....	......	......	1	......	......	6	......	9	11	5	19	4	5	2	9	5	1	......	1	5
Ridgewood	7	......	3	13	5	......	28	....	....	1	......	......	......	......	......	......	2	2	1	5	2	2	1	6	......	1	......	......	1
Saddle River	7	3	2	13	8	1	34	....	....	......	2	......	......	......	......	......	6	2	5	2	......	3	1	1	7	1	......	......	1
Union	18	5	6	16	7	2	54	....	....	......	2	2	......	3	......	......	10	......	3	6	3	2	......	3	1	3	......	1	8
Washington	13	3	1	7	28	......	52	....	....	......	1	......	......	2	......	1	5	3	1	8	3	2	5	7	3	3	1	......	1
Totals	166	60	65	252	228	3	774	48,696	15.90	4	16	4	4	10	24	1	83	40	43	141	40	54	39	82	33	19	4	19	46

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1891.

BURLINGTON COUNTY. Population, 58,722. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bass River	4	3	......	2	9	1	19	......	......	......	......	......	....	3	....	.....	1	.....	1	7	......	3	......	1	......	......	......	......	......
Beverly	5	2	5	17	9	1	39	......	......	......	2	1	....	1	1	.....	2	4	1	4	......	2	......	4	8	1	......	......	3
Bordentown	12	9	5	26	34	2	88	4,232	20.79	......	2	2	....	2	2	.....	6	6	4	6	3	10	6	7	7	2	1	......	9
Burlington	21	17	19	53	41	......	151	7,386	20.44	......	7	...	....	1	10	1	7	15	9	19	12	15	12	8	7	3	2	2	8
Chester	15	4	6	17	20	......	62	......	......	......	2	....	....	...	6	.....	7	3	2	5	2	4	6	8	2	5	......	1	......
Chesterfield	2	3	7	3	......	......	15	......	......	......	2	....	....	...	1	.....	....	1	1	5	......	......	2	......	......	......	......	......	......
Cinnaminson	11	3	4	17	16	......	51	......	......	......	2	2	....	3	1	.....	2	7	2	3	2	7	1	6	2	3	......	......	2
Delran	9	3	3	5	16	......	36	......	......	1	1	2	....	....	....	.....	3	1	3	7	2	......	1	3	4	2	......	......	2
Eastampton	2	4	2	2	3	......	13	......	......	......	......	....	....	....	3	.....	1	.....	1	1	1	......	......	2	1	1	1	......	......
Evesham	4	1	4	7	6	......	22	......	......	......	1	......	....	....	2	.....	2	1	5	3	......	2	......	3	......	......	......	1	......
Florence	8	4	5	7	3	1	28	......	......	......	......	......	....	....	5	.....	4	....	1	4	3	3	......	1	2	1	......	......	1
Little Egg Harbor	6	......	2	6	6	......	20	......	......	......	......	......	....	....	......	.....	2	2	......	2	1	2	1	4	1	1	......	......	......
Lumberton	3	3	......	3	3	......	12	......	......	......	......	......	....	....	......	.....	5	......	2	......	1	......	......	1	1	1	......	......	1
Mansfield	4	2	2	7	10	1	26	......	......	......	......	......	....	....	......	.....	2	......	......	6	3	......	1	3	2	1	1	......	4
Medford	8	2	1	6	17	......	34	......	......	......	1	2	....	....	....	.....	3	2	1	7	......	4	2	2	3	......	......	......	2
Mount Laurel	3	......	......	2	5	......	10	......	......	......	......	......	......	....	......	.....	2	1	......	1	......	......	1	1	......	3	......	......	......
New Hanover	8	3	2	10	4	......	27	......	......	......	4	......	......	....	......	.....	1	2	4	1	3	......	......	3	......	1	......	1	......
Northampton	22	16	14	32	42	......	126	......	......	1	5	2	....	2	11	1	12	8	5	21	4	7	3	15	7	2	2	3	5
Pemberton	4	4	2	12	9	......	31	......	......	1	......	......	......	....	1	....	5	2	.....	3	......	1	4	2	3	1	......	1	1
Randolph	1	......	......	1	2	......	4	......	......	......	......	......	......	1	.....	......	......	......	1	1	......	......	......	......	1	......	......	......	......
Shamong	3	1	1	2	2	......	9	......	......	1	1	......	......	......	......	......	2	......	......	1	1	1	......	1	1	......	......	......	......
Southampton	2	1	......	4	2	......	9	......	......	......	......	......	......	....	....	......	1	3	1	......	1	......	......	......	1	1	......	......	......
Springfield	2	2	2	6	2	......	14	......	......	1	......	......	....	......	1	......	1	1	1	1	1	1	1	......	......	1	......	......	2
Washington	1	......	1	......	2	......	4	......	......	......	......	....	......	......	......	......	1	....	......	......	......	1	......	....	1	......	1	......	......
Westampton	3	1	......	1	5	......	10	......	......	......	......	......	...	......	......	......	2	1	......	1	......	......	......	......	2	......	......	......	......
Willingboro	1	1	......	2	1	......	5	......	......	......	......	......	......	1	......	......	1	.....	1	.....	......	......	......	1	......	......	......	1	......
Woodland	1	......	......	...	1	......	2	......	......	......	......	......	....	....	....	....	......	....	....	1	......	......	......	......	1	......	......	......	......
Totals	165	89	57	250	270	6	867	58,722	14 76	5	30	11	....	14	44	2	75	60	46	110	40	63	41	76	57	30	8	10	40

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

CAMDEN COUNTY. Population, 89,887. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Camden City	369	239	175	389	229	6	1,407	59,398	23.68	9	33	19	......	24	192	3	197	67	87	113	121	79	43	81	60	35	3	14	51
Centre	17	4	4	9	11	......	45	......	......	......	......	......	......	......	1	1	8	3	3	1	7	2	1	7	1	......	......	......	2
Delaware	7	1	2	2	8	......	20	......	......	......	......	......	......	......	......	......	4	2	1	3	......	1	......	1	2	......	......	1	......
Gloucester City	40	16	14	45	30	1	146	6,683	21.85	......	5	......	......	5	5	......	20	8	10	14	7	9	5	9	10	3	......	......	15
Gloucester	11	6	6	27	29	3	82	......	......	......	2	......	......	......	6	......	7	2	5	7	3	10	2	18	11	2	......	......	......
Haddon	14	2	7	11	20	......	54	......	......	......	3	......	......	1	2	......	7	1	2	8	3	7	1	5	5	3	......	......	3
Stockton	43	18	16	46	19	2	144	......	......	2	8	3	......	1	7	......	14	9	4	14	17	8	7	4	5	3	......	......	14
Waterford	7	4	5	9	10	......	35	......	......	......	1	......	......	1	3	......	4	2	......	3	4	2	1	4	2	1	......	......	2
Winslow	9	2	1	9	9	......	30	......	......	......	1	......	......	......	......	......	4	1	1	5	3	2	1	3	4	1	......	......	2
Totals	517	292	230	547	365	12	1,963	89,887	21.84	11	53	22	......	32	216	4	265	95	113	168	165	120	61	132	100	48	3	15	89

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

CAPE MAY COUNTY. Population, 11,372. Statistical Divisions	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Cape May City	8	......	1	13	13	......	35	......	......	1	......	......	......	......	......	......	5	2	......	1	2	4	2	8	4	2	......	......	2
Dennis	7	2	3	9	11	1	33	......	......	......	1	2	1	......	2	......	3	3	2	2	3	2	2	5	1	......	......	......	......
Lower	7	3	2	6	13	......	31	......	......	......	......	......	......	......	3	......	3	......	3	1	1	2	2	7	1	......	1	......	3
Middle	4	2	3	13	13	1	36	......	......	......	2	......	......	......	2	......	3	3	1	2	1	1	1	8	6	2	......	......	1
Upper	8	2	7	8	9	1	35	......	......	......	......	......	......	1	3	1	4	2	2	......	1	1	2	4	7	2	......	......	1
Totals	34	9	16	49	59	3	170	11,372	14.95	1	3	2	1	1	10	1	18	10	8	6	8	10	9	32	19	6	1	......	7

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

CUMBERLAND COUNTY. Population, 46,129. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung disease.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases	Digestive and intestinal diseases	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bridgeton	51	35	44	41	52	5	228	11,695	19 50	2	8	5	......	2	40	1	19	7	14	18	14	21	8	18	9	8	......	3	8
Commercial	......	......	......	1	2	......	3	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1	2	......	......	......	......
Deerfield	3	6	2	14	8	......	33	......	......	......	......	......	......	......	......	......	5	3	......	2	2	5	4	2	3	1	......	......	4
Downe	......	......	1	3	5	......	9	......	......	......	......	......	......	......	......	1	......	2	......	1	......	3	......	......	......	1	......	......	......
Fairfield	3	6	3	4	5	......	21	......	......	1	......	......	......	......	6	......	2	1	1	2	2	......	......	1	2	......	......	1	......
Greenwich	6	1	4	4	4	......	19	......	......	......	......	......	......	1	......	......	2	1	2	1	2	1	......	......	1	1	......	......	2
Hopewell	3	1	3	8	22	......	37	......	......	......	......	......	......	......	......	......	......	4	......	8	4	1	3	5	5	1	......	......	2
Landis	16	8	11	37	43	1	116	......	......	......	4	......	......	......	3	......	10	13	8	9	6	16	7	11	7	4	......	2	4
Lawrence	9	1	......	6	12	......	28	......	......	......	......	......	......	1	......	......	4	1	2	1	1	2	2	5	3	......	......	......	......
Maurice River	11	5	1	7	15	......	39	......	......	......	......	......	......	......	1	......	2	2	1	7	3	5	......	7	2	2	......	......	1
Millville	39	32	23	42	33	1	170	10,287	16.61	......	10	......	1	1	27	......	20	17	12	14	11	11	3	13	5	2	1	......	5
Stoe Creek	......	......	1	7	8	......	16	......	......	......	1	......	......	......	1	......	......	......	2	3	......	1	1	1	2	......	......	2	2
Totals	141	95	93	174	209	7	719	46,129	15.59	3	23	5	1	5	78	2	64	51	42	66	45	66	28	64	41	20	1	8	28

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

ESSEX COUNTY. Population, 264,564. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Belleville	19	4	6	22	12	......	63	....	......	3	5	......	......	......	......	......	10	3	1	4	3	6	3	5	5	2	2	......	3
Bloomfield	20	9	11	37	37	1	115	....	......	......	2	......	2	1	9	2	7	8	7	17	3	13	6	10	8	4	......	2	5
Caldwell	6	2	1	15	18	......	42	....	......	......	1	......	......	......	......	......	4	5	3	7	2	7	4	1	3	1	......	1	1
Clinton	12	3	1	6	18	......	40	....	......	......	2	......	......	1	1	2	4	2	5	3	3	1	......	6	4	......	......	......	......
East Orange	51	11	17	50	59	1	189	....	......	......	4	1	......	4	11	......	14	10	11	28	10	16	11	12	6	3	2	4	2
Franklin	5	......	1	7	10	......	23	....	......	......	......	......	1	......	......	......	......	2	1	4	3	4	......	2	1	......	......	2	2
Livingston	4	1	1	2	3	......	11	....	......	......	......	......	......	......	......	......	3	......	......	......	2	......	......	2	1	......	......	......	2
Millburn	8	3	3	16	11	......	41	....	......	3	......	......	......	......	1	......	5	4	3	1	2	5	......	8	1	2	......	2	1
Montclair	30	12	13	32	34	......	121	....	......	......	3	......	2	1	9	......	12	12	8	16	3	7	10	12	8	3	......	......	1
Newark	1156	545	338	1586	787	8	4,420	186,598	23.69	32	131	45	15	52	196	12	523	366	268	597	370	264	185	332	242	96	6	37	181
Orange	85	67	43	146	55	1	397	19,566	20.29	1	9	3	2	2	41	2	33	45	23	66	28	19	24	24	9	5	......	3	9
South Orange	20	5	8	17	13	......	63	....	......	......	2	1	......	......	1	1	10	6	3	10	6	3	2	2	......	3	......	1	3
West Orange	16	6	5	21	17	......	65	....	......	......	1	......	......	......	4	......	4	2	6	9	5	9	7	4	5	......	......	......	2
Totals	1432	668	448	1957	1074	11	5,590	264,564	21.13	39	163	50	22	61	273	19	629	465	339	762	440	354	252	420	293	120	10	52	212

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

GLOUCESTER COUNTY. Population, 28,858. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Clayton	8	5	7	10	4	......	34	......	......	......	1	......	......	1	2	......	5	3	4	3	3	3	......	3	1	......	......	......	1
Deptford	10	5	2	9	4	......	30	......	......	......	......	......	......	......	2	......	7	2	2	1	4	3	......	......	4	......	......	......	1
East Greenwich	6	1	2	5	5	......	19	......	......	......	1	......	......	......	......	......	2	2	......	1	2	......	4	2	......	2	......	......	......
Franklin	7	2	......	3	10	......	22	......	......	......	......	......	......	......	......	......	2	1	......	3	2	3	1	4	1	......	......	......	......
Glassboro	9	5	3	6	10	......	33	......	......	......	1	......	......	......	4	......	3	2	3	3	2	1	......	5	2	1	......	......	......
Greenwich	9	5	4	7	6	......	31	......	......	......	1	1	......	1	3	......	5	......	......	3	2	5	1	2	1	......	1	......	3
Harrison	5	......	4	6	10	......	25	......	......	......	2	......	......	......	2	......	1	......	3	3	......	1	2	1	2	1	......	1	......
Logan	4	......	3	4	4	......	15	......	......	......	2	......	......	......	......	......	3	1	......	1	2	......	......	......	2	......	......	......	1
Mantua	4	6	3	8	11	......	32	......	......	......	......	2	......	......	......	......	2	4	3	3	4	3	1	5	1	......	......	......	1
Monroe	11	3	7	7	9	1	38	......	......	......	2	......	......	......	3	......	2	2	......	5	4	......	2	4	4	......	......	......	2
South Harrison	3	......	......	2	3	......	8	......	......	......	......	......	......	1	......	......	......	......	......	......	1	2	1	......	1	......	......	......	......
Washington	6	......	4	5	6	......	21	......	......	......	1	......	......	......	1	......	2	......	1	3	......	4	......	2	1	......	......	......	1
West Deptford	7	1	1	5	3	1	18	......	......	......	......	1	......	......	......	......	......	......	......	3	......	1	......	2	......	......	......	......	6
Woodbury	15	2	3	13	30	......	63	......	......	......	1	......	......	......	......	......	5	7	4	5	2	6	6	9	1	3	1	......	3
Woolwich	9	3	5	9	14	......	40	......	......	......	1	1	......	......	2	1	7	......	1	6	......	2	1	3	2	2	......	1	4
Totals	113	38	48	99	129	2	429	28,858	14.86	......	13	5	......	3	19	1	46	24	21	43	28	34	19	42	23	9	2	2	23

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

HUDSON COUNTY. Population, 282,062. Statistical Divisions.	DEATHS AT ALL AGES. Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH. Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bayonne	139	60	37	124	52	......	412	20,223	20.37	2	7	11	3	1	14	2	62	22	16	60	48	15	15	19	27	1	.....	3	27
Guttenberg	22	8	1	13	9	......	53	....	....	......	......	....	....	....	3	....	13	3	....	7	5	2	....	4	2	1	.....	......	5
Harrison	76	44	17	104	33	......	274	8,648	31.70	7	2	3	8	5	10	....	31	13	9	50	35	12	8	18	21	3	.....	2	15
Hoboken	305	186	83	404	158	3	1,139	44,833	25.41	2	14	10	14	4	93	4	140	92	50	184	95	75	42	70	52	20	.....	9	65
Jersey City	1068	709	418	1618	567	6	4,386	161,901	26.60	33	167	63	70	28	295	14	407	272	232	794	395	230	174	203	223	82	6	54	224
Kearny	42	29	11	64	25	......	171	....	....	3	5	....	1	2	12	....	19	14	2	27	18	10	5	14	4	2	.....	2	20
North Bergen	54	41	13	85	66	3	262	....	....	2	2	3	9	......	14	....	28	20	20	38	15	10	10	51	10	6	.....	2	7
Town of Union	74	84	31	62	38	......	289	11,092	26.05	3	5	10	5	......	53	2	44	12	11	38	25	10	11	15	14	3	1	3	2
Union	15	9	3	11	4	......	42	....	....	1	1	1	......	1	4	1	8	1	2	11	3	....	2	2	2	.....	.....	......	......
Weehawken	11	11	2	21	4	1	50	....	....	......	1	.....	......	......	6	....	5	1	2	12	3	3	1	1	2	.....	.....	1	10
West Hoboken	78	63	28	54	48	......	271	....	....	3	7	4	4	1	52	3	40	10	14	32	19	13	11	15	12	1	.....	1	3
Totals	1884	1244	644	2560	1004	13	7,349	282,062	26.05	56	211	105	114	42	556	26	797	460	358	1253	661	380	279	412	369	119	7	77	378

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

HUNTERDON COUNTY. Population, 35,355. Statistical Divisions	DEATHS AT ALL AGES.							Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Alexandria	4		1	5	7		17									1	3	1			1	1	2	4	2				1
Bethlehem	4	1	3	10	18		36										1	4	3	5		4	3	8	4				
Clinton	1			6	12		19				2						1	3	1	3		4		2	2				
Delaware	7	4	1	14	21		47						1		2		5	3	6	5	1	2	2	8	5	2		1	
East Amwell	4		2	1	9		16				1	1					3	1	1	1	1	1		3	1	1			
Franklin	2		1	6	10		19								1			1	1	3	1	3		1	2		1		3
Frenchtown	1			8	6	1	16											1	3	1		4	2	3					1
High Bridge	5	3		9	10		27							1	1		1	3	1	3	2	1	2	5	1	1			2
Holland	3	1		8	14		26				2	1					2	1	2	4		1	2	4	2			1	1
Kingwood	2	1		7	8		18						1				2	1		1	1	2	1	3	2	2			1
Lambertville	13	11	11	23	29		87				3	1	1		6		4	6	3	12	2	4	7	15	6	7			
Lebanon	14	3	1	7	9		34				1		1		2		4	2		3	2	4	1	3	2			2	
Raritan	7	1		13	28		49			1							4	3	2	9		6	5	8	2	4			1
Readington	8	2	4	14	22		50				1				3		5	3	3	7	1	4	5	8	1	3		1	1
Tewksbury	5	1	1	2	12		21										1	1		3	2	5		4	2				1
Union	2		1	5	9		17										2	1		3		4		5	2				
West Amwell	4		2	3	7		16				2				1		2		1					5		1			
Totals	86	28	28	141	231	1	515	35,355	14.57	1	12	3	4	1	16	1	40	35	27	63	14	50	32	89	36	21	1	5	12

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

MERCER COUNTY. Population, 82,616. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
East Windsor	1	1	4	12	20	......	38	....	....	......	2	......	......	......	1	......	2	......	5	6	......	6	4	4	5	......	......	......	2
Ewing	3	2	1	47	39	1	98	....	....	1	3	......	......	1	1	1	3	6	12	8	......	4	5	40	5	......	......	......	3
Hamilton	12	6	4	41	32	......	95	....	....	......	1	......	......	3	......	......	5	7	8	9	6	9	8	14	6	3	......	......	8
Hopewell	13	1	5	20	27	......	66	....	....	1	4	......	1	1	......	......	6	4	3	3	2	3	2	11	3	......	......	2	8
Lawrence	3	2	5	4	6	......	20	....	....	......	......	......	......	1	......	......	1	1	1	3	1	1	......	2	2	......	......	......	3
Princeton	17	1	4	26	30	......	78	....	....	1	2	......	......	......	......	2	7	5	7	8	2	14	7	6	4	1	......	4	......
Trenton	247	153	88	261	169	11	929	59,896	15.51	3	16	13	7	10	67	2	116	69	41	104	67	44	48	79	40	28	......	12	35
Washington	3	1	......	4	11	......	19	....	....	......	......	......	......	1	......	......	1	2	......	3	1	1	1	5	......	1	......	......	1
West Windsor	4	1	1	2	5	2	15	....	....	1	1	......	......	......	......	1	6	......	......	1	......	4	1	......	......	......	......	......	......
Totals	303	168	112	417	339	14	1,358	82,616	16.44	7	29	13	8	17	69	6	147	94	77	145	79	86	76	161	65	33	......	18	60

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

MIDDLESEX COUNTY. Population, 62,868. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Cranbury	4	......	2	7	12	1	26	....	....	......	1	......	......	1	......	1	4	......	2	2	......	3	2	6	2	......	......	1	......
East Brunswick	7	4	5	9	10	......	35	....	....	2	1	2	3	2	1	......	3	3	1	3	1	2	2	2	2	1	1	1	1
Madison	......	2	1	4	5	......	12	....	....	1	......	1	......	......	......	......	2	......	......	1	......	......	......	5	1	......	......	......	1
Monroe	9	1	4	9	8	2	33	....	....	......	......	......	......	......	......	......	2	3	2	4	4	6	1	3	2	......	1	......	1
New Brunswick	52	38	21	112	96	8	327	18,672	17.51	3	6	4	7	8	5	1	26	21	17	65	15	29	24	29	15	12	2	6	11
North Brunswick	2	1	2	7	5	......	17	....	....	......	1	1	......	......	......	......	......	1	1	2	2	......	2	3	2	......	......	1	1
Perth Amboy	68	49	28	62	27	......	234	10,152	23.05	5	9	1	2	2	29	......	38	6	7	37	14	8	11	7	8	......	......	3	15
Piscataway	10	3	3	17	23	......	56	....	....	......	1	......	1	2	1	......	5	......	1	5	2	9	3	6	3	2	......	1	6
Raritan	7	2	5	18	37	1	70	....	....	......	1	......	......	1	1	......	4	2	6	15	3	6	2	10	4	3	1	......	5
Sayreville	7	7	5	15	7	1	42	....	....	......	4	1	......	1	1	......	6	3	2	4	3	4	......	1	4	1	......	......	4
South Amboy	32	7	4	19	13	......	75	....	....	2	......	......	1	2	1	......	14	1	3	11	3	5	3	4	5	2	......	2	3
South Brunswick	11	3	2	12	15	......	43	....	....	......	......	......	......	1	......	......	4	......	5	9	1	4	2	5	1	2	......	......	......
Woodbridge	18	9	3	31	22	1	84	....	....	1	2	1	2	4	2	1	6	8	5	11	3	4	4	8	4	4	......	......	7
Totals	227	126	85	322	280	14	1,054	62,868	16.77	14	26	11	16	24	41	3	114	48	52	169	51	80	56	89	53	27	5	15	55

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

MONMOUTH COUNTY. Population, 70,488. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic	4	2	......	3	14	......	23	......	......	......	1	......	......	1	......	......	3	......	3	2	......	1	......	4	3	......	......	......	1
Eatontown	2	7	4	12	11	......	36	......	......	......	......	......	......	......	......	......	4	3	6	8	4	1	2	3	1	......	......	......	2
Freehold	16	3	4	32	35	......	90	......	......	......	6	......	......	......	......	......	10	5	8	13	5	7	2	9	7	2	......	......	7
Holmdel	6	1	1	9	9	......	26	......	......	......	......	......	......	......	......	......	2	3	1	10	1	2	2	2	......	......	......	......	1
Howell	8	4	1	9	11	2	35	......	......	......	1	......	......	......	2	......	6	4	2	5	1	1	1	5	1	......	......	......	2
Long Branch	16	9	5	34	26	3	93	7,649	12.16	......	1	......	......	......	6	......	7	9	8	8	4	14	......	10	4	1	......	2	10
Manalapan	4	2	1	5	7	......	19	......	......	......	......	......	......	1	......	......	3	1	2	1	1	4	1	......	2	1	1	......	......
Marlboro	5	3	3	8	9	......	28	......	......	......	......	......	......	......	......	......	5	1	......	5	1	2	2	3	5	1	......	1	1
Matawan	18	6	10	17	23	......	74	......	......	......	......	......	1	1	4	1	5	2	8	11	4	6	1	5	8	......	1	......	7
Middletown	26	14	6	31	26	......	103	......	......	3	3	1	1	1	5	......	11	10	5	21	7	8	3	2	4	5	1	1	3
Millstone	3	1	2	9	9	......	24	......	......	......	......	......	......	......	......	......	2	1	1	5	......	7	2	1	1	1	......	1	......
Neptune	53	16	12	53	55	1	190	......	......	1	4	1	......	1	5	......	23	8	12	18	8	11	8	32	12	6	......	......	6
Ocean	......	1	2	4	5	......	12	......	......	......	......	......	......	......	2	......	......	2	......	2	......	2	......	2	......	......	......	......	1
Raritan	16	8	9	16	13	......	62	......	......	......	......	......	......	5	3	......	12	2	2	8	3	2	3	5	5	2	......	......	3
Shrewsbury	56	11	6	39	42	1	155	......	......	2	3	......	1	......	2	1	42	11	6	14	7	18	7	12	7	4	......	1	5
Upper Freehold	9	2	6	8	23	......	48	......	......	......	1	......	......	......	......	......	2	2	3	10	2	1	3	11	2	......	......	2	......
Wall	28	8	5	20	22	......	83	......	......	......	2	......	1	......	2	......	16	......	4	3	5	5	3	9	10	2	......	......	7
Totals	270	98	77	309	340	7	1,101	70,488	15.62	6	22	2	4	10	32	2	153	64	71	144	53	92	40	115	72	25	3	8	56

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

MORRIS COUNTY. Population, 54,766. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Boonton	9	2	1	12	8	......	32	......	......	1	1	......	......	1	......	1	5	2	1	3	2	2	1	2	1	......	......	......	5
Chatham	13	8	7	27	25	......	80	......	......	1	1	5	1	......	3	......	4	9	6	10	8	9	3	6	4	2	1	......	......
Chester	13	3	4	3	9	......	32	......	......	......	......	......	1	......	2	......	1	1	1	5	5	3	......	3	1	1	1	......	2
Hanover	4	3	4	57	60	1	129	......	......	1	......	......	......	......	......	......	2	4	10	11	2	10	3	67	5	3	......	1	2
Jefferson	4	4	3	4	8	......	23	......	......	......	......	......	......	......	......	......	3	1	......	......	3	3	......	2	3	......	......	2	......
Mendham	2	......	1	3	8	......	14	......	......	......	......	......	......	......	......	......	1	2	2	1	......	1	......	3	......	1	......	......	......
Montville	5	1	......	4	14	......	24	......	......	......	......	......	......	......	......	......	2	......	2	1	......	5	3	6	1	......	......	......	1
Morristown	14	10	7	44	58	2	135	8,156	16.55	......	1	......	......	......	5	......	10	7	13	16	3	13	5	24	9	4	3	3	5
Mount Olive	5	1	2	11	11	1	31	......	......	......	......	......	1	1	......	......	2	2	5	7	......	2	1	1	2	2	......	......	......
Passaic	7	5	......	8	12	......	32	......	......	......	......	......	......	......	3	......	4	2	1	6	3	1	2	3	4	......	......	......	1
Pequannock	8	5	2	12	10	......	37	......	......	......	1	......	......	2	......	......	2	1	1	7	3	6	......	4	1	......	......	3	1
Randolph	30	10	8	40	31	......	119	......	......	......	2	......	4	2	2	......	13	5	8	21	5	11	3	8	8	3	......	......	7
Rockaway	24	9	5	26	14	......	78	......	......	2	1	......	1	1	2	......	8	3	3	12	2	7	5	6	4	......	......	......	10
Roxbury	12	4	4	13	18	3	54	......	......	1	......	......	......	......	1	......	3	1	6	8	3	4	3	4	1	5	......	......	4
Washington	6	4	1	10	11	......	32	......	......	......	1	......	3	......	......	......	2	......	1	4	4	4	3	3	3	1	......	......	2
Totals	156	69	49	274	297	7	852	54,766	15.56	6	8	5	11	7	18	1	62	40	60	112	43	81	32	142	47	22	5	9	40

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

OCEAN COUNTY. Population, 16,051. Statistical Divisions	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Berkeley	3	......	2	2	6	......	13	......	......	......	......	......	......	......	......	......	3	......	......	......	......	2	......	3	1	1	......	......	1
Brick	11	4	9	23	22	2	71	......	......	......	......	......	......	1	5	......	8	8	4	6	2	7	5	3	7	2	2	......	5
Dover	7	4	......	12	14	......	37	......	......	......	......	......	......	1	......	......	2	2	3	3	3	3	2	6	2	......	1	......	3
Eagleswood	2	7	......	7	4	......	20	......	......	......	1	......	......	1	......	......	8	1	......	......	......	2	......	......	2	1	......	1	3
Jackson	3	3	1	4	10	......	21	......	......	......	......	1	......	......	1	......	3	1	1	3	1	3	......	2	1	1	1	......	1
Lacey	2	2	2	1	3	......	10	......	......	......	......	......	1	......	1	......	3	......	......	1	......	......	1	1	1	......	......	......	......
Manchester	......	1	1	3	10	......	15	......	......	......	......	......	......	......	......	......	......	......	1	1	......	3	......	2	2	1	......	......	1
Ocean	1	......	......	2	1	......	4	......	......	......	......	......	......	1	......	......	......	2	......	......	......	......	......	......	1	......	......	......	......
Plumstead	1	1	1	4	4	......	11	......	......	......	1	......	......	......	......	......	1	......	1	3	......	2	......	1	1	1	......	......	......
Stafford	1	4	5	11	6	......	27	......	......	......	1	3	......	1	......	1	......	1	1	1	1	2	......	3	3	1	......	......	4
Union	3	......	......	......	10	......	13	......	......		......	......	......	......	......	......	3	2	......	......	......	2	......	3	......	......	1	......	......
Totals	34	26	21	69	90	2	242	16,051	15.07	......	3	4	1	5	7	1	31	17	11	20	7	26	8	24	21	8	5	1	18

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

PASSAIC COUNTY. Population, 109,380. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Acquackanonk	9	2	5	10	8	......	34	......	......	1	......	1	......	......	3	......	......	1	......	3	2	3	2	5	3	1	......	1	1
Little Falls	11	6	3	5	6	......	31	......	......	......	2	......	......	......	1	......	6	3	1	2	4	2	1	......	1	......	1	......	1
Manchester	10	4	......	12	6	......	32	......	......	1	......	......	......	......	1	......	1	2	......	5	5	4	1	1	3	......	......	1	2
Passaic	99	71	34	81	47	......	332	13,968	23.77	2	11	......	10	......	32	......	52	21	7	57	34	18	6	13	19	8	......	1	14
Paterson	475	310	186	571	322	3	1,867	81,361	22.95	3	17	22	31	26	161	7	217	113	118	333	123	124	63	91	93	38	2	14	87
Pompton	5	2	2	7	8	1	25	......	......	1	1	......	......	......	2	......	1	2	1	2	1	2	......	2	3	......	......	1	1
Wayne	2	4	3	5	10	......	24	......	......	......	......	2	......	......	......	......	1	1	1	6	1	3	......	1	2	......	......	1	5
West Milford	9	6	4	11	11	1	42	......	......	......	......	......	1	......	6	......	9	2	3	3	2	4	......	5	2	......	......	......	4
Totals	620	405	237	702	418	5	2,387	109,380	21.82	8	31	25	42	26	206	7	287	145	131	411	172	160	73	118	126	47	3	19	115

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

SALEM COUNTY. Population, 25,151. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Alloway..	3	1	2	5	16	......	27	....	....	.....	......	......	......	......	......	......	3	2	1	4	......	2	4	4	3	3	......	......	......
Elsinboro..	3	......	......	4	1	1	9	....	....	.....	......	......	......	......	......	......	3	......	3	......	......	......	......	......	1	......	......	......	1
Lower Alloways Creek	3	1	4	6	6	......	20	....	....	.....	......	......	......	......	......	......	2	......	......	3	1	3	......	7	2	......	......	......	2
Lower Penns Neck..	4	1	......	6	3	1	15	....	....	.....	......	......	......	1	......	......	2	1	3	2	......	......	......	......	2	......	1	1	......
Mannington	7	3	......	8	11	......	29	....	....	1	......	......	......	......	1	......	4	2	2	5	......	3	1	2	2	1	......	......	......
Oldmans	6	......	1	3	4	......	14	....	....	.....	1	......	......	......	......	......	2	......	1	1	......	3	......	1	2	......	......	......	......
Pilesgrove	13	6	5	19	27	......	70	....	....	.....	......	......	......	1	1	......	5	7	10	8	2	8	4	8	5	4	......	......	1
Pittsgrove	7	3	5	7	13	......	35	....	....	.....	1	2	......	......	3	......	4	1	1	2	1	3	5	6	2	......	......	......	2
Quinton	12	3	3	3	4	......	25	....	....	.....	......	......	......	......	1	......	6	2	1	2	1	1	......	1	1	......	......	2	......
Salem City	21	8	3	22	39	......	93	5,516	16.86	.....	3	......	......	1	......	......	10	6	3	9	6	12	1	13	10	4	......	......	2
Upper Penns Neck	4	5	......	6	7	......	22	....	....	.....	1	......	......	......	1	......	5	1	2	1	......	1	1	2	1	......	......	1	......
Upper Pittsgrove	4	1	1	1	8	......	15	....	....	.....	......	......	......	1	1	......	1	......	......	......	1	4	2	......	1	......	......	......	1
Totals	87	32	24	90	139	2	374	25,151	14.87	1	6	2	......	4	8	......	47	22	27	37	12	40	18	44	32	12	1	4	9

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

SOMERSET COUNTY. Population, 28,488. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bedminster	4	1	1	5	19	2	32	......	......	3	1	2	......	......	......	......	......	1	2	6	1	4	1	3	1	......	......	1	2
Bernards	2	1	......	12	14	......	29	......	......	......	......	......	......	......	......	......	1	3	3	4	......	4	1	2	3	1	......	1	4
Branchburg	3	......	1	6	9	......	19	......	......	......	......	......	......	......	......	......	......	1	1	4	......	2	2	3	4	......	......	......	......
Bridgewater	29	4	10	44	43	......	130	......	......	......	1	2	1	1	2	......	11	7	7	23	2	11	6	15	9	5	......	......	8
Franklin	13	1	6	22	32	1	75	......	......	......	5	......	2	......	......	1	10	3	4	8	3	9	6	11	6	2	......	2	1
Hillsborough	10	3	3	10	19	......	45	......	......	......	1	......	......	......	2	......	6	1	2	6	3	4	......	8	2	......	......	......	5
Montgomery	5	1	1	6	13	......	26	......	......	......	......	......	......	......	1	......	3	2	1	1	......	3	1	6	3	......	......	1	2
North Plainfield	9	9	4	15	20	......	57	......	......	1	......	......	......	2	1	......	5	5	3	10	3	7	2	4	5	1	1	1	2
Warren	3	......	2	4	8	......	17	......	......	......	......	......	......	......	......	......	1	2	2	2	......	3	2	1	1	......	......	......	1
Totals	78	20	28	124	177	3	430	28,488	15.09	4	8	4	3	3	6	1	37	25	25	64	12	47	21	53	34	9	1	6	25

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

SUSSEX COUNTY. Population, 22,259. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Andover	2	1	2	2	9	.....	16	....	....	1	.....	.....	.....	1	1	.....	1	2	.....	1	.....	2	1	2	3	.....	.....	.....	.....
Byram	2	.....	3	2	4	.....	11	....	....	.....	.....	.....	.....	.....	1	.....	1	1	.....	1	.....	2	2	1	.....	.....	.....	.....	1
Frankford	3	.....	3	9	16	1	32	....	....	.....	.....	.....	.....	.....	.....	.....	2	1	6	4	1	5	2	4	2	1	.....	.....	1
Green	3	3	.....	5	5	2	18	....	....	.....	1	.....	.....	.....	1	.....	4	.....	.....	2	1	1	1	4	1	.....	.....	.....	1
Hampton	2	.....	.....	1	5	1	9	....	....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	1	.....	2	.....	3	.....	.....	.....	.....	1
Hardyston	7	4	5	11	5	.....	32	....	....	.....	2	.....	.....	.....	.....	.....	11	2	1	3	1	5	.....	1	3	1	.....	1	.....
Lafayette	2	.....	2	5	5	1	15	....	....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	3	.....	.....	2	2	1	1	.....	1	1
Montague	1	.....	1	5	.....	.....	7	....	....	.....	1	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Newton	6	2	4	11	15	.....	38	....	....	.....	.....	.....	1	.....	.....	.....	2	2	3	13	.....	3	1	5	2	1	.....	2	.....
Sandyston	1	2	.....	3	9	.....	15	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	2	1	.....	2	1	.....	1	1
Sparta	3	4	2	4	14	.....	27	....	....	.....	.....	.....	.....	.....	.....	.....	4	.....	2	7	2	4	.....	5	1	.....	.....	.....	.....
Stillwater	2	.....	.....	1	2	.....	5	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	1	.....
Vernon	4	1	.....	6	5	.....	16	....	....	.....	.....	.....	.....	.....	.....	.....	1	1	1	4	.....	2	1	.....	.....	1	1	.....	.....
Walpack	2	1	1	2	6	.....	12	....	....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	4	.....	1	1	1	2	.....	.....	1	.....
Wantage	5	3	.....	10	28	1	47	....	....	1	2	.....	.....	.....	1	.....	3	3	2	6	4	7	1	10	2	2	.....	.....	1
Totals	45	21	23	77	128	6	300	22,259	13.48	2	6	.....	1	1	6	.....	33	18	16	63	10	37	13	39	19	8	1	7	9

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1891.

UNION COUNTY. Population, 74,592. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Clark	......	......	......	2	1	......	3	......	......	......	......	......	......	......	......	......	......	1	1	......	......	1	......	......	......	......	......	......	......
Cranford	2	......	5	6	3	......	16	......	......	1	2	1	......	......	......	......	......	1	1	1	......	3	......	2	1	1	......	......	1
Elizabeth	221	102	52	251	129	......	755	38,893	19.41	5	5	4	......	15	51	3	79	42	36	138	59	43	26	60	32	9	4	7	50
Fanwood	2	1	1	4	8	......	16	......	......	......	1	......	......	......	1	......	1	......	2	3	......	......	......	3	1	2	......	......	1
Linden	7	5	1	10	12	......	35	......	......	......	1	......	......	......	4	......	1	2	......	4	4	5	1	3	2	......	......	......	3
New Providence	4	2	......	6	8	1	21	......	......	1	......	......	......	......	1	......	1	4	1	4	......	2	......	......	4	......	1	......	......
Plainfield	47	20	15	61	53	2	198	11,737	16.87	1	3	5	2	4	4	......	24	8	13	27	11	22	10	22	9	4	2	2	10
Rahway	27	8	16	36	39	......	126	7,153	17.61	1	2	......	1	......	4	1	12	11	9	16	14	12	10	10	4	3	......	......	10
Springfield	2	1	......	7	4	......	14	......	......	1	......	......	......	......	......	......	2	3	2	......	......	......	1	......	1	3	......	1	......
Summit	12	5	2	18	9	......	46	......	......	......	......	......	......	......	1	......	7	6	3	6	6	7	......	1	1	1	......	......	2
Union	6	......	3	8	16	......	33	......	......	1	......	......	......	......	1	......	2	3	......	3	2	1	3	4	1	......	......	......	5
Westfield	7	3	1	12	20	......	43	......	......	......	......	......	......	......	2	1	6	2	3	6	......	3	2	2	12	......	1	......	1
Totals	337	147	96	421	302	3	1,306	74,592	17.51	11	14	10	3	19	69	5	135	83	70	208	96	99	53	107	68	23	8	10	83

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June, 30th, 1891.

WARREN COUNTY. Population, 36,319. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																			
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Typhoid fever.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Allamuchy	1	......	......	1	5	1	8	......	......	......	......	......	......	......	......	......	......	1	......	1	......	3	......	......	1	......	......	......	1
Belvidere	1	......	1	8	12	......	22	......	......	......	......	......	......	......	......	......	......	......	1	6	1	2	2	6	......	1	......	1	1
Blairstown	3	2	2	5	6	......	18	......	......	......	1	......	......	......	......	......	1	......	2	2	2	1	3	......	2	......	......	2	1
Franklin	2	2	......	1	8	......	13	......	......	......	......	......	1	......	......	......	......	......	......	2	2	2	1	2	1	......	......	......	......
Frelinghuysen	1	......	2	6	......	......	9	......	......	......	......	......	......	......	......	......	......	1	......	1	......	......	......	3	2	......	......	......	1
Greenwich	1	1	2	3	11	......	18	......	......	......	1	......	......	......	......	......	1	......	2	2	2	3	......	4	1	......	......	......	1
Hackettstown	8	6	6	7	15	......	42	......	......	......	1	......	3	......	......	......	5	3	2	7	1	2	3	3	1	......	1	......	1
Hardwick	2	......	1	1	3	......	7	......	......	......	......	......	......	......	......	......	......	......	1	......	......	1	1	1	1	......	......	......	......
Harmony	2	2	......	3	6	......	13	......	......	......	2	......	1	......	......	......	2	......	1	2	......	1	......	1	1	......	......	......	1
Hope	3	1	2	4	1	1	12	......	......	......	......	......	......	......	......	......	1	......	......	5	1	......	1	1	2	......	......	......	......
Independence	2	......	1	2	4	......	9	......	......	......	......	......	......	......	......	......	......	......	1	......	......	......	1	......	1	2	......	1	......
Knowlton	5	......	1	5	7	......	18	......	......	......	......	......	1	......	......	......	2	1	1	2	......	2	2	2	2	1	......	......	......
Lopatcong	5	3	2	5	3	......	18	......	......	......	......	......	......	......	......	......	3	......	1	2	3	3	2	1	......	......	......	......	1
Mansfield	3	1	......	7	14	......	25	......	......	......	......	......	......	......	......	......	2	1	......	3	2	7	......	4	1	1	......	......	1
Oxford	12	14	5	24	18	......	73	......	......	1	......	......	......	6	2	......	10	3	5	15	2	5	4	5	5	3	1	......	2
Pahaquarry	......	......	......	2	1	......	3	......	......	......	......	......	......	......	......	......	......	1	1	......	......	......	1	......	......	......	......	......	......
Phillipsburg	32	14	14	44	34	......	138	8,761	15.75	......	4	1	4	1	2	......	19	5	11	13	9	8	7	6	14	6	......	2	11
Pohatcong	6	3	4	3	8	......	24	......	......	......	......	......	......	......	5	......	2	......	......	......	......	4	......	4	2	1	......	......	2
Washington	16	5	4	17	23	......	65	......	......	......	......	1	......	2	1	......	14	5	3	6	2	2	4	3	5	3	......	2	6
Totals	105	54	47	148	179	2	535	36,319	14.73	1	9	2	10	9	10	......	62	21	32	69	27	46	32	46	42	18	2	8	30

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SIXTEENTH ANNUAL REPORT

UNIV. OF MICH.
JUN 29 1909

OF THE

BOARD OF HEALTH

OF THE

STATE OF NEW JERSEY,

AND REPORT OF THE

BUREAU OF VITAL STATISTICS.

1892.

TRENTON, N. J.:
THE JOHN L. MURPHY PUBLISHING COMPANY, PRINTERS.
1892.

THE STATE BOARD OF HEALTH.

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Prof. **John C. Smock**, Ph.D., State Geologist,	

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Secretary	**E. M. Hunt.**

SECRETARY'S REPORT.

To His Excellency Leon Abbett:

GOVERNOR—The State Board of Health of New Jersey has the honor herewith to present to Your Excellency, and through you to the Legislature of this State, its annual report for 1892. Each successive year presents new evidence of the necessity of preventive hygiene and of the need of the application of its laws in the interest of public and personal health. As a science and art it comprehends a large sphere of inquiry and relates to interests which are at the very foundation of society and of State and national prosperity.

Among its subjects are all those that relate to the social condition of the people in our efforts to rid them of the ravages and burdens of preventable disease, such as purity of water-supply, proper dwellings for the working classes without overcrowding or deficiency of light and air, adulterated or diseased food, complete drainage, disinfection of excrement, the preservation of rivers and smaller streams from pollution, the regulation of the hours of labor, the protection of childhood from the imposition of toil and its proper education in commodious, healthy buildings, cleanliness of streets, the establishment of public baths, the operations of quarantine to prevent invasion of pestilence and landing of immigrants with diseases dangerous to others, the isolation of persons attacked with infectious diseases, and the disinfection of localities, the construction and management of general and special hospitals, the care of the sick poor in their homes.

"Sanitary progress demands many things—statesmanlike direction on the part of the central authority, a policy of education rather than of coercion, a gradual development as against fussy interference, intelligent co-operation on the part of the local authority, a certain knowledge of sanitary cause and effect, a steady sense of public duty. In no part of life is the need of a broad conception of the interdependence of the various bodies of the body politic so pressing."

The necessities for progress in this department are scientific precision as to the causes and sources of disease, and the modes of its prevention and limitation; such diffusion of knowledge as will secure sanitary intelligence among the people, or at least their officers; the enactment of such laws as will give force and effect to sanitary measures, and securement of Sanitary Inspectors who know what efficient service requires, and who are diligent in its performance. Thus far the knowledge of what is necessary is far in advance of its practical application. The various publications of the Board have done much to acquaint the people with their needs and Boards of Health with their duties. Our laws, while they will no doubt from time to time need extension, are now among the most perfect in the nation, and admit of facile and forceful application to the requirements of communities. Our great lack is in such Sanitary Inspectors as recognize that something more is needed than the ability to detect a nuisance, and Boards of Health that will by strict discipline require of their Inspectors the thorough performance of their duty. The time is not far distant when no Inspector, especially in cities, should be appointed until, after due examination had, he has received his certificate of fitness from the State Board of Health.

During the past year we have had to report no prevalent epidemic. Influenza, which for the former two or three years has added so much to the death-rate of the winter and spring, has mostly subsided or become less severe. The small-pox, which threatened an epidemic in four of our principal cities, was kept within moderate bounds by active sanitary care. It greatly impressed the importance of vaccination, and especially that the provisions as to it, both in the school laws and in the health laws, should be fully carried out. It is hoped that the new and valuable plan of school census will be so carried out as to acquaint us more fully with the names and number of unvaccinated children, and that school authorities and Health Boards will rigidly insist that unvaccinated children shall not attend school, and thus subject one another and the people to greater risks from this malady.

While there has been the usual prevalence of diphtheria and scarlet fever in some localities, where thorough plans of cleanliness and isolation are carried out, we have full evidence of our ability to limit the disease.

The event of the year has been the anxiety caused by the advent of cholera in New York City after so fearful a record of destruction in Asia, in Russia and localities in Eastern Europe with which the United States is in constant communication. It became an evident duty of all Health Boards in this State to be in effective readiness to prevent importation into this State, to deal with first cases and to be in skilled resistance to anything that would promote epidemic extension. We hereafter detail the measures adopted by the State Board and by Local Boards, and add such facts as to cholera as may be of use in the near future. Your Excellency has already shown his pleasure at the fact that our system of health laws was found to confer on a Board all necessary powers, and has aided to stimulate our Board to the most active and effective administration.

In the experience of preparation and in the dealing with the few exposures that occurred, we have had ample illustration of the skillful comprehension of some Boards as to their duty, and a warning, by contrast, of the few that were slow or feebly organized.

WATER-SUPPLIES.

The subject of water-supply has for the past two years had considerable increase of attention in this State. This has arisen from the fact that some of our towns already having a public water-supply had secured it long since without skilled choice of source, while others had been deteriorated by nuisances along the banks of streams by sewerage of other cities or by evils connected with the supply in the immediate city dependent upon it. Some cities were looking with difficulty for new sources of supply, while others have found themselves compelled to seek a public supply in place of wells which had served for a less compact population.

Our reports bear testimony how for years, by urgency and warning, we have drawn attention to this whole subject—in some cases with good results, while in others corporate companies have been wiser in their generation than municipal corporations, and have secured advantages which ought to have been retained by the cities themselves. The increasing prevalence of typhoid fever in large centers, and especially in those of faulty water-supply, together with the facts of the relation of cholera and other epidemic diseases to impure water, makes it imperative upon us to earnestly invoke the aid of the Legislature in selecting and guarding sources, in testing conditions and in general in securing good and safe water as one indispensable necessity for health sustained.

POLLUTION OF STREAMS.

It is a most important question to what degree the refuse from privies and the soiled liquids from households shall be allowed to pass into the streams. It has all its degrees from the discharge of a small pipe running from the family sink or out-house to that of the large sewer, carrying its tons and its millions of gallons of decayable material. Practically it is first of all a question of proportion. Ten gallons of liquids running from the sink of a private family into the meadow brook is not to be asserted to be an evil, even though by standing at the outlet of the drain-pipe you may detect an odor. The compost spread thickly over a field in preparation for a grain crop makes odor in carting or while being ploughed under, but cannot be asserted to be a risk to health unless in some unusually foul condition or made up of animal and other matters in a state of putrescent decomposition. The stream, like the soil, has the power of adequate and safe disposal of a large amount of flowing sewage passing into it. But suppose some changes. Instead of the light stream of recent refuse and liquid from the single home, let it be the contents of a cesspool or some other form of long-stored, unnatural filth. In the place of one house have the discharge of five hundred kitchens, and an equal number of water-closets. Let the stream which usually has a flow of thousands of gallons, by reason of drought become but a little rivulet, so that the sewage is the chief part of the flow. Besides, let there be all along its banks stoppages in which are lodged large quantities of foul matter, under the heat of a summer sun. Who does not see that these changed conditions arising from a change of proportion do not involve wholly new questions as to the effects on health? What happens to the town or meadow brook may to a less or greater degree happen to the river. Hence, it is not a maxim or theory we have to deal with, but an actual condition. Again, it is true that the capacity of a river to deal with sewage depends upon the character of its bottom, of its banks, of its tide, of its smooth or troubled flow, of its volume, of its course, of its vegetation, of its fish and water-plant life, season of the year and many other things. Also, if it is a stream used for potable water, upon the distance between the point of reception of any sewage and the point at which water is taken out for drinking purposes.

While some general principles can be stated, it is easy to see from these facts that each river and stream and each system of sewer discharge into it are individual and local studies, and must chiefly be determined by the facts in evidence furnished by chemistry, by biology, by the census, by the records of sickness or death, of the general disturbance of accustomed vigor. It is marvelous what differences of record occur. One river, independent of its animal life, has such an exuberance of appropriate plant life and of conservative micro-organisms as to seem quite fully to dispose of all objectionable material, while another does little of this. Some of these subjects have been fully discussed in former reports.

The whole subject is one still needing careful study, especially as to each river and district, and especially as to those towns dependent on rivers for their water-supply.

DISPOSAL OF SEWAGE IN INLAND TOWNS.

In present methods of house-building and of what we call our modern improvements, the disposal of sewage becomes one of the vexed but essential questions of the day. Next to purity within the house and the removal therefrom of all debris is the importance of purity around the house. This means purity of the ground, since without it purity of air cannot be secured. Clean, well-drained soil, not too tenacious, and with a gravelly subsoil, will take care of much foul liquid or solid without harm, if so be the material is not thrown in one place but scattered over it at intervals and before decay has advanced too far. It is on this principle that the compost thrown over the field does no harm. The laws of absorption and the air, grasses and grains compete with each other in its healthful disposal. But so soon as we come to place such matter in a great bulk of fluid, to crowd houses close upon each other and to multiply the amount of indoor waste, there must be more artificial methods of riddance.

First comes the open cesspool, which so often saturates the soil around the cellar and sends befouled air into it, or up from the ground about it. Then comes the closed or cemented cesspool, which, because of its rapid filling and expensive removal, is so often impracticable. Next comes the method of small-pipe disposal by a system of subsoil irrigation through small pipes and with flush tank, which is valuable in some soils and for many private houses, but which has not proved very satisfactory when applied to larger towns or cities.

There are then left two chief systems, the one that of direct conveyance to the sea or to large bodies of water, and the other that of land disposal by some of the various forms of surface irrigation or intermittent and downward filtration. We might have added as a third plan that of precipitation and chemical treatment, but since with this there is an effluent which has to be disposed of, it has, notwithstanding its great value, to be considered mostly as an adjuvant to, or modification of land disposal.

The disposal of sewage by pipe conveyance to waterways or the sea has much to commend it. There are rivers that are far more valuable for this use than for the supply of potable water, and notwithstanding some æsthetic objections, there are compensations and economies which make it most feasible. It is especially important for New Jersey because our large cities will always be not far from tidewater, and even our chief inland towns much nearer to the mouths of streams than to their headwaters. Where the streams are not large there are many of these in which it is feasible by pipe-lines to deliver the sewage nearer to the sea, or for several towns to combine in doing it.

Where it is not desirable to deliver sewage into salt water or into streams directly in front of cities, delivery can be had at places more sparsely populated. Especially is this true if chemical or precipitation works be combined with the system.

For instance, is it not feasible to construct all along our shore from Sandy Hook to Cape May a pipe-sewer line, with here and there a pumping and precipitating plant, on intermediate marsh or uninhabited lands, which could thus dispose of all this material into the sea? But with all this it will remain that land methods of dealing with sewage, not far from towns and villages, or from places which soon become such, will have to be relied upon by a large number of inland localities.

We need, therefore, to face the question whether this can be done without injury or risk to the general health. It has already been answered in many places abroad just as it will have to be answered here. First, such disposal can easily be secured without risk to the public health, if locality is well chosen by skilled engineers and sanitarians, and if the administration or management of the methods is kept up to the best known standards. In an age of greed and in case of companies whose object is, too often, that of money more than of health, this is the great risk. If such places are chosen, not without the approval of a State Board of Health, or other independent responsibility, and if the laws and local authorities are rigid and facile in dealing with the least approach toward nuisance, the system of land disposal, aided, if need be, by chemical methods, is entirely feasible and satisfactory. The desired end will be attained, not by special acts of legislation, pushed through by interested parties, not by hearings before State officials, but by committing the power of decision to those who are held responsible therefor, or who must suffer in professional reputation by any mistake. The public, too, must be educated to discriminate between objections made under the cover of risk to health, when the only real fear is as to injury to property. For instance, it is not pleasant to have a graveyard at your front door, even if there are but forty headstones, and no possibility of risk to air or water-supply, or to have a blacksmith and wheelwright shop alongside your palatial residence. We only claim that due regard must be had to the necessities of inland towns as to removal of sewage, and that the health interests of the many and the testimonies of expert experience must not be sacrificed to the desires of the few. Let private rights be duly guarded, and proper compensation made when it should be, but let not our growing villages and towns be so embarrassed as to their disposal of sewage as to cause risk to health, life and comfort far beyond any that can result from a well-chosen and properly-directed locality for the disposal of sewage.

LIGHT AND SUNLIGHT AS PREVENTIONS OF AND CURATIVES FOR DISEASE.

Air and light are often spoken of together as to their healthful and remedial effects. Yet such prominence is given to the supply of air that we too often forget that equal prominence should be given to the supply of light. The history of the microphytes of disease, so far as known, closely allies them with the history of moulds, fungi and all cryptogamic vegetation. So far as we know, the cryptogamic growths that take place on surfaces in the absence of light do not conduce to health, while many of them are factors in or incident to disease.

New evidences are constantly accumulating as to the chemical, transforming and remedial action of light. Hence the admission of light in abundance to all houses is desirable.

It is as true of every room the light should enter in each day as that it should be well aired. It is doubtful whether, on the ground of health, a basement or cellar should ever be allowed in a compact city, for they so often mean dampness and darkness, two great powers for disease. Many country houses would be better off if they had no cellars and were built on pillars resting on the ground.

Sunlight is still more valuable. Once the bacillus tuberculosis was talked of as if "immortal," but Koch, in his Berlin address, August 4th, 1890, says: "Direct sunlight can kill bacteria pretty rapidly, and I can verify this as regards to tubercle bacilli, which are killed in a few minutes or hours, according to the thickness of the layer in which they are exposed to sunlight. What appears to me of special importance is the fact that diffused sunlight has the same effect, though proportionately more slowly; I have found that cultures of tubercle bacilli died in five or seven days when exposed to the windows." One able writer (C. Candler, *Lancet*, September 19th, 1891) says: "The sum of phthisis has been determined by the number of under-sunned bed-rooms in a community," and that "the sun has, in all countries, in all ages, governed the incidence of consumption."

We need to appreciate the vast importance of light in its relations to microphytes. It is not enough to speak of it in a general way. The study of windows, not only as to their numbers, but locality and the degree to which skylights can be made available in more parts of a building than the attic, needs close study.

The question of how far light can be reflected into rooms a part or whole of the day, or temporarily for its cleansing effects, is also important. Buildings are constantly increasing in compaction and height, and somehow we must make them more habitable. There is a question how far electric light can be made available in place of sunlight in preventing mould or other low forms of life.

We desire to impress all with the value of light as a cleanser and as a preventer of disease, and to urge that it shall be made more available for sanitary purposes. If you cannot send light into every corner of your cellar, whitewash its walls all the oftener, and have it as a rule that at least three or four times a year all the movable contents of the cellar shall be turned out of doors to bask in the sunshine.

BOARDS OF HEALTH AS TO CHOLERA.

Under another heading will be found various facts as to cholera. We here notice only the action had in this State and by this Board in reference thereto. When it became known that the cholera, which had been so long in Asia, had reached Europe, this Board, in common with others, recognized that it would be likely to occur in this country. In the latter part of August various Boards were visited with direct reference to preparation for its advent. Especial attention was given to the Boards along New York bay and Hudson river. Active and earnest response was made, especially by the City Boards of Hoboken and Jersey City, and before August closed it can be said that both of these cities were in an active state of preparation, and in many respects prepared for any case that might occur. An Inspector of this Board, August 29th, arranged with the City Board of New York, through Dr. Edson, who kindly offered to help meet any sudden emergency and to provide biological examination for any suspected cases that might occur. Cholera Circular 45 was rapidly distributed to all Local Boards in the State, and soon after an annex thereto sent far and wide. By personal visits, letter and telegraph, access was had at once to all important points. Several Boards were found moving of themselves, and glad to have such additional outline of method as we were ready to give.

As immigrants were our first source of danger, by reason of the several steamship companies that land on the New Jersey side, we applied to the Marine Hospital Service for special aid in view of the general exposure to commerce occurring at Jersey City and Hoboken. Our request was granted, and we fortunately secured the service of Dr. William I. Kudlich, of Hoboken, who was put in full oversight of all vessel and railroad transportation of immigrants.

Next letters, and soon after a general circular were addressed to the railroads of the State, and there was rapid and earnest response. The chief companies at once requested a conference, and proceeded to active sanitary inspection and correction of defects.

September 6th, by request of His Excellency, the Board met with Governor Abbett, outlined to him what had been done, and what was proposed to be done, listened to his suggestions and found itself encouraged in its work by his urgency and offers of help. It was recognized by all with great satisfaction that the provisions of our sanitary laws and the powers of Local Boards enabled us to secure all needed arrangements. Especial attention was at once given to the Russian colonies in South Jersey, and to any other localities which needed especial inquiry or attention. The Local Boards along the shore were promptly aided by patrol to gather floating material from cholera or other ships. Very soon after special attention had to be given to the fact that the General Government announced its intention of occupying Sandy Hook with a suspect camp. Immediate and urgent attention was given by Governor Abbett and the Board to questions arising as to its occupancy. While for obvious reasons its temporary use had to be submitted to, every precaution was taken as to non-intercourse, and arrangements were made by which the people of Monmouth county would be protected from any risk of the invasion of the pestilence from this source. In all our pressure of duties we were greatly aided by Dr. A. Clark Hunt, Dr. Henry Mitchell and Dr. Mecray, as Inspectors for the Board. With credit not less to the Local Boards than to the excellent system of State and local health administration which has been provided, it can be said that at all important points the State was placed upon a resisting footing, although as is always the case there still would need to be more extended outlays in case of actual invasion. It was found necessary to arrange with the Central Railroad of New Jersey as to transportation to Sandy Hook, and a temporary quarantine was there established.

Our first State exposure seemed to be in the case of a man and his wife, who died in New York City from cholera September 13th, and who had visited near Paterson while one of them was sick. Dr. Leal, of Paterson, was telegraphed authority to act as State Inspector and give aid to the Local Board of the township, and with great promptness the house was located and all necessary disinfection had. Many rumors of cases came to the Board, and various inquiries by letter and telegram by day and by night, but only one case reported proved to be Asiatic cholera. This was that of Carr, of New Brunswick. He was taken sick the night of September 17th, and his case stated to be Asiatic cholera by Drs. H. R. and V. N. Baldwin, of New Brunswick. He died the next day. Biological examination verified the diagnosis after his death.

The whole preparation to meet an epidemic, should it occur, was creditable to the Local Boards of the State, and the physicians and those who represented the citizens in municipal and township affairs.

While there was in some cases unnecessary alarm, there was at least no cleansing done that is not equally efficient for the limitation of those preventable diseases which month after month aggregate a far greater loss than an epidemic of Asiatic cholera is ever likely to equal. If we are to judge the future by the past, it is most likely that another year will bring us cases of cholera here and there throughout the country. Because of it, and because of the great and pressing needs of most localities, and of attention to general sanitation, to immigration and to railroad sanitation, our Boards should be on the alert in the work already at hand.

We are glad to know that Newark is erecting a disinfecting plant, such as should, to a greater or less degree, be provided in other cities. (See article on disinfectants.)

We urge upon all Local Boards immediate, thorough house-to-house inspection and attention to all details. We must be prepared for cholera if it comes, and if not, thorough sanitary administration always has its reward.

This Board has expressed the view that the State should own a barge hospital or transport, to be kept near New York harbor and under State direction, to be available for cholera, typhus fever, yellow fever or other sudden emergencies of disease.

Local Boards should have a house or tents at their command for first cases of serious contagious disease. It is as important to deal specially with the first case of such a disease as it is with the first outbreak of a flame from a building on fire.

THE HOUSING OF THE PEOPLE.

The sanitary condition of dwelling-houses is a subject which can never be dismissed from the consideration of the sanitarian. This oversight is integral and essential to the health and safety of the people. Even those who own their houses need the protection of Building Inspectors, who by their special knowledge shall determine as to the safe and healthy construction of houses, and the oversight of the Sanitary Inspector, who can detect perils to health arising from imperfect structure or from settling, breakage of pipes, decay of timber and other causes.

But it is especially the very large class who rent, and do not own their houses, or who assemble or work in buildings which they do not own, that must have the protection which only law and faithful sanitary inspection can secure. Experience has shown that hasty and imperfect building is one of the perils of the time. Dwellings built on wet or otherwise unsuitable ground, errors in the joining of various pipes and fixtures, such exclusion of light or air as secures dampness, and imperfect care and cleansing of houses, are the rule rather than the exception.

Filth that accumulates in the open street or alley is more offensive to the eye and to the nose, but is not so dangerous to health or life. Every rented house, every factory and often school-houses, and residences owned by the occupants, need this kind of constant, systematic supervision. This is especially true of all houses containing two or more families, of lodging-houses, and especially of that large class of tenement-houses which are multiplying in every city. No one can take up such a book as that by M. Riis, of New York City, "How the Other Half Lives," or various similar books as to the larger cities of England, or the various magazines of our own country (see *Review of Reviews*, January, 1892, &c.), without knowing that this is a burning question alike as to health, and society, and political economy. The great increase of large tenement-houses is already showing results in Hudson and Essex counties. In many of our cities more than two families occupy one house, and lodging-houses are under no system of skilled inspection. The "Sweating System," the "Cigar Industry" and others, have revealed a fearful crowding in tenement-house industry.

The subject of the housing of all renting classes has received so much attention in Great Britain for the last three or four years as to have become a governmental specialty. In Manchester, England, the scheme is so elaborate as that the city itself has bought a condemned area at a price of $515,000, which is to be rebuilt by the municipality and let out directly to the tenants. Huddersfield has already a common lodging-house of its own, and lets directly to occupants 157 houses. It also owns the brewery and street-car lines, and runs one at a loss in order to prevent crowding in the center of the town, and "to open out new outlying quarters as suitable sites for artisans' dwellings." While our American methods might not admit such competition by municipalities with private ownership and enterprise, it is far better than the overcrowding of men, and women, and children, which is making progress in some of our cities. We ask that City Boards of Health regard their chief work to be the care of the inside of buildings, that we have not whited sepulchers in our fair exteriors, and that the protection of the whole people from the diseases which lurk in their homes may be secured.

DISPOSAL OF GARBAGE.

The proper disposal of the more solid refuse of cities still continues to be a subject of the highest importance to the welfare of the inhabitants. All cities, and even villages, where the houses are closely built on a few streets, need some easy and systematic method to prevent any storage of vegetable or animal matter, or even ashes (which become compost heaps), upon the small premises of town lots. It is a matter of great import whether such material is promptly removed or allowed to become a mass of rotten and stenchy refuse. The habit which some cities have of dumping it in adjoining townships or on vacant lots or marshy places within city limits, is strongly to be condemned. Yet we know of a prominent city which had such a dumping-ground in its very midst, which having once gotten on fire for a week seemed to be too much for the Health Board, and after the fire was quenched the dumping was resumed. There was, and is, an unusual amount of diphtheria, throat diseases, &c., in that town. We have already, in Circular 61 of this Board, indicated some of the methods of disposal of house refuse, to prevent large accumulations, and also, in an article on cremation of garbage (twelfth report), have drawn full attention to the modes of destruction by fire. These forms of apparatus have been much improved, and we have sufficient testimony, both in England and this country, that when properly made and handled they afford a feasible and economical way for the disposal of garbage.

They have also been applied with success to the disposal of privy-vault material. Besides these more elaborate structures, several inventions have been made which seek to destroy much of house and kitchen refuse by the fire from the house furnace or kitchen range. The Engle arrangement for this purpose is well known. The New

Jersey Nitrate Company seem to have given a satisfactory exhibit of their method and apparatus at Asbury Park.

"The garbage destroyer is sixteen inches square and twenty-six inches high, and is so connected with the kitchen range and the chimney that the heat from a fire rapidly dries all refuse put into the box, and the draught carries all odors high into the air. The garbage from three residences had been saved, and the accumulation placed in the destroyer. The heat from the stove had reduced all to a perfectly dry state, so that when a light was applied it burned rapidly, leaving a few ashes in the bottom. No odors were discernible, and the experiment was declared a success."

Our desire is to call attention more fully to this home destruction of kitchen refuse, as also to insist upon it that the removal of city garbage and the disposal of it while fresh is most essential to every municipality.

RAILROAD SANITATION.

In any plans for improving the health conditions of the people, or for protecting them from disease, railroad sanitation must have large consideration.

With the immense number of people transported through this State, it cannot but happen that there will be those actually suffering from communicable diseases. The general conditions of travel, also, as related to draughts in cars, heating and ventilation, condition of floors, seats and closets, as to stations and all their appendages, and as to the handling of material, such as live stock, fertilizers, meats and perishable fruits, present a most important and complicated subject for regulation. Wherever any building, conveyance, assembly-room or water-holders, wash-rooms or water-closets are in promiscuous use and not under the care of some skilled housekeeper, the attainment of requisite cleanliness is greatly complicated. Few of our railroads have so estimated this as to make of this service a skilled division in charge of those who have special knowledge, and who see to it that sanitary measures are carried out with efficiency. So far as sleeping cars and all other cars are concerned, there is need of some radical change, both structural and administrative. With the banishment of stoves there must come methods of ventilation that change the air but expose less to draught and such as shall not leave windows to be opened and closed at pleasure. If a pure-air temperature of 70 degrees, for instance, is maintained at the center and each end of the car, there is a test, and the person who is uncomfortable must, by clothing and otherwise adjust himself, and not expect everything else adjusted to him. The inside architecture of cars needs to have less panels and ledges for dust and dirt. Floors and seats must either have an outside covering to be washed or else be provided with something else than carpet and plush upholstery. The water-holders must be assured as to their inside condition and as to the sources of water from which they are supplied. The whole closet arrangement needs to be modified so that secretions not disinfected shall not be strewn along highways. Porters of sleeping cars must not huddle things together in closets as they do, and be in as much hurry to disembark at the end of the route as are the passengers. One is too often reminded that white aprons do not take the place of the bath and of body and garment cleanliness.

All stations need to be under exact regulations as to the modes of cleansing walls, paint and floors, as to the condition of cellars and as to the use made of various disinfectants. All cesspool and sewer connections must be known, as well as condition of traps and all fixtures. Not only should exact structural description be kept at each railroad office, but wells and all conservency methods should be described. The administration of all these can only be secured by the unexpected visits of a General Inspector, who shall not only be told what is done, but see for himself the conditions of structure and the degree of thoroughness with which administrative methods are applied. It has been charming, in connection with the anxiety as to cholera, to find so ready response on the part of railroad corporations, but it has revealed a lack of that definite, systematic recognition of skilled sanitary care which is essential in this department. We urge attention to this whole subject in the general interests of health, as well as to those special needs which are felt when cholera, typhoid fever, diphtheria, small-pox or other epidemic diseases are prevalent.

The condition of freight and cattle cars and the modes of moving and storage of fertilizers are also of great importance. Most serious and well-founded complaints come to us from towns and rural districts as to the handling and side-tracking of compost cars, and sometimes as to the condition and variety of the materials which are conveyed under this name. We urge upon all companies a thorough re-organization of this service for the future, and in the interests of public health we shall, as a Board, give still more attention thereto.

We draw the attention of all Local Boards to the fact that any nuisances arising from stations, from storage and distribution of noxious material, or from condition of cars or passengers, while within their territorial limits, fall as fully under their charge as any other sanitary matters.

Because of the special exposure of the traveling public, all these interests should receive their special attention. Under the heading of "Circulars and Laws" will be found a brief circular letter which the Board addressed to railroad companies during the last summer.

MOUTH-CLEANSERS.

We have heretofore insisted upon the great importance of mouth-cleansing as a sanitary measure. By reason of errors in food and diet, of the great varieties of particles which often find too long lodgment in the mouth, of abnormal secretions from stomach and lungs and decaying teeth, or adjacent glands, and the various defilements received through the air, it is rarely that a perfectly sweet and pure breath is secured without some unusual precaution. Recent facts more and more emphasize the relation of the mouth and throat to the sedation of micro-organisms and the development of various diseases. It is even claimed that non-specific diseases not unfrequently pass from person to person owing to mouth and throat condition. Human mouths and human breaths are so frequently brought into contact between person and person, that from early childhood up, the habit of mouth-cleansing should be more common. Let it begin by teaching the child to take a good swallow of water at the close of each meal, and in time be followed up by rinsing of the mouth and cleansing of the teeth. It is now generally admitted that a clean mouth and breath is one of the best protectives against disease, and that an opposite condition invites, as to a fertilizing soil, the micro-organisms of various diseases. It is desirable to have ready at hand some cheap and disinfecting lotion or powder that admits of frequent use, and yet one not so unpleasant as to be objectionable. We have made personal trial of two washes and one powder, all of which are recognized as having valuable aseptic and antiseptic qualities, and which are not objectionable on account of taste.

One dram of thymol (crystals) may be dissolved in one ounce of alcohol, two ounces of glycerine and one quart of hot water, and make a convenient mouth and tooth-wash. It has the flavor of oil of thyme.

The following is a good disinfectant wash:

R.

Acid Benzoic	dr. i.
Tinc. Eucalypt	dr. v.
Alcohol (absolute)	oz. iv.
Ol. Menth. Pip	gtt. xv.

This for use should be diluted by putting one dram or teaspoonful in an ounce or two tablespoonfuls of water. While not agreeable at first, it soon becomes very tolerable and is a valuable combination.

A tooth-wash highly recommended by Parker, in his work on Diphtheria, we have found excellent. It is as follows:

Precipitated Chalk, one ounce.
Powdered White Soap, two ounces.
Pure Phenol and Eucalyptus Oil, of each one-half dram.

We refer to what has been said on this subject in our last two reports, and make this addition in order to emphasize the importance of this care.

PRESENT VIEWS AS TO THE ORIGIN AND CONTROL OF COMMUNICABLE DISEASES.

BY EZRA M. HUNT, M.D.

Much confusion has arisen in the discussion of the origin of diseases from the use of too many terms or from the use of the same term in different senses. For instance, the dictionaries, authorities and writers on medical subjects do not yet agree in their definitions and distinctions as to the words contagious, infectious, miasmatic. The old and convenient distinctions of idio-miasmata and koino-miasmata (Prof. J. M. Smith, M.D., &c.) have been apparently retired by the progress of modern discovery. In the present transition state of our knowledge we see no other way to begin the study of a large class of diseases than to associate them under the general term communicable or transmissible, and then to define how, in what degree and under what circumstances they are communicable.

The first proposition which we may consider is that most diseases are associated with a micro-organism or microphyte, and, if so, are communicable. Sir John Simon long ago claimed that contagium is an element, is the causation of all inflammation. He indicated that "even non-specific, clean, uncontaminated inflammations are more or less spreading or contagious." He made, however, a difference between common and specific inflammations, and regarded specific contagion as dependent on individual susceptibility. About the same time (1870) Burdon-Sanderson maintained a similar view, not as to all inflammation, but as to what we have called specific inflammation. He also spoke of them as particulate, or as, owing to extremely minute particles of matter, "conveyed from a primarily-inflamed part to other parts previously healthy." Soon after Prof. Hallier set forth the view that specific "contagia are in their essence living microphytes," thus defining "the particulate" in a large number of cases. Thus early, however, we had the intimation that there must be something else to determine inflammation or disease than the fact that a specific microphyte was in reach, for Kocher, of Berne, showed that severe injuries, which produce no suppuration, could, at will, be made to do so "by what might be called a septic regimen, or feeding on putrid food." Passing over incidental discoveries we as early as 1876 came to a time when what may be called the Lister doctrine secured recognition, viz., that "suppuration could only be brought about with the concurrence of microphytes." We now, however, know, as Prof. Sanderson expresses it, that "suppuration can be produced by chemical agents in the absence of microphytes, and, secondly, that when it is produced by microphytes the action is chemical." So completely has the Lister doctrine dominated the world that it has spread far beyond the domain of surgery, so that the erroneous dictum of Weigert, "no suppuration without bacteria," became to be accepted by a multitude of writers on general medicine so as to read "no communicable disease without a specific microphyte," or, to be translated still more broadly, "every communicable disease has a specific microphyte and is owing thereto," and for that reason is communicable. This impression has been so far fortified by the actual finding of a specific microphyte in anthrax, tuberculosis, &c., that it is marvelous how far the dictum has prevailed and how heretical it has seemed to be, to doubt that a microphyte is the cause of every specific disease, and that the chief end of man, when he practices medicine, is to keep out the microphyte, and to kill it when found. That this is one of his chief ends is true. We just now cannot pause to note the curious claims of this abounding literature, and its incompleteness when brought to any of the tests which obtain in laws of evidence, or which are required in experimental science in respect of exactness of data and essential numbers of observations properly analyzed so as to be classified into knowledge.

It even yet goes so far with very many as to deny to the individual any relationship except that of receptivity, or to regard him or his condition as at all the cause of disease. It dismisses the doctrine of heredity, fortified by such weight of evidence, or minimizes it into a general condition of unresistibility of all morbific agents.

It is refreshing now to see that once more the individual is gaining recognition as well as the microphyte. So far as surgery is concerned, Burdon-Sanderson expresses it thus: "Experiments show that the readiness with which pus is formed depends on the condition which belongs to the animal rather than to the noxa." It is equally true that the readiness with which many communicable diseases are developed, as well as their benign or malign type, depends upon the individual rather than on the microphyte, not now to speak of the modification both as to communicability and virulency which occurs from environment and surroundings.

We are compelled, in view of more recent facts, to question whether there is not in many diseases an antecedent condition which is itself a progress of the disease justifying the remark of Prof. Jacobi, at the Medical Congress at Washington (1891), that "tuberculosis will not attack a healthy lung." See also Gibbs-Shirley, &c., or the contention of Prof. Hutchinson, of London, that lupus is lupus before the arrival of the bacillus tuberculosis.

At least as to diphtheria, cancers, tuberculosis and various other affections, while admitting the significance, the ominous portent and intimate partnership of the microphyte, have we not still to study antecedent conditions not as correlative, but as radical, primal or essential? Since, too, we have to do with microphytes, not botanically or biologically so much as chemically, *i. e.* with their juices or the toxines they furnish, and as some inflammation can go on without them, we have a broad field of inquiry into the chemical and physico-chemical and perhaps the psycho-chemical character of some communicable diseases.

The individual is taking his place in the study of etiology and is not always to be viewed as the well-nigh inevitable victim to an outside force.

Still more does light come as to the individual when we find the resisting forces of the human organism, and that leucocytes become phagocytes (Metchnikoff), or the blood serum circulates prophylactic fluids probably by reason of defensive protides therein contained (Hankin).

While the study of microphytes must still go on most ardently, we are no longer looking solely after germicides in the cure of some diseases. We have a new phase of inquiry submitted somewhat thus: Given the fact that microphytes abound and that there is often hopelessness as to their destruction, can we not prevent disease best or most by attention to the host or individual? In this respect three great lights are shining forth. The one is in the possibility of rendering the system immune by some form of vaccination or attenuation. As to this there are various schools as yet, some claiming that cure can come about without the killing of the microphyte, others that it can come by means of its own products introduced by hypodermic injection or in some other way, and others still that various chemicals can act as antitoxics or prophylactics.

The second is the so-called doctrine of phagocytosis, represented first by Metchnikoff and accepted in indirect or modified form by Bouchard and Chaveau, Brouardel, Ruffer, &c. This recognizes as ever present in the human system the leucocyte or white corpuscle ready to become a destroyer of disturbing abnormal particles, whether they be irritating specks or veritable microphytes, or their products known as toxics. Ruffer (see lecture in *Lancet*, December 20th, 1891) thus described the action: "Microscopic examination of such section shows that the bacilli are extremely active, the leucocytes attracted to the spot by the poison secreted by the micro-organism migrate in enormous numbers through the paper fibers, until eventually bacilli and leucocytes meet and the struggle can be seen in all its intensity, for most of the leucocytes are absolutely crammed with degenerated bacilli." Hence they are called phagocytes—feeders or destructors.

The third doctrine is that of defensive proteids. It is thus stated by Woodhull: "The defensive proteids or alexins, in which upon this theory these qualities reside, appear to be ferment-like, albuminous bodies, which, in the absence of other physiological tests, Mr. Hankin proposes to divide into two provisional classes, sozins and phylaxins. A sozin is a defensive proteid that occurs naturally in a normal animal. They have been found in all animals yet examined. A phylaxin is a defensive proteid only found in an animal artificially made immune, and which, so far as known, only acts on one kind of microbe or its products. Each may be subdivided into those that act on the microbe itself and those that act on the poison it generates."

The conservative biology of the day is contending that the struggle for life against communicable diseases is to be fought out, not only by effort to destroy microphytes everywhere, but by securing efficient white corpuscles in the blood and tissues which can deal with microphytes and their products. This means all that good alimentation and good hygiene mean. It means to limit epidemics chiefly by fortifying the individual, providing everything necessary to the perfect health and overcoming all those conditions, whether inherited or acquired, which furnish weak or unstable leucocytes, and so making the phagocyte a conqueror in that inevitable contest which must from time to time take place in the human system. Here, then, we can at least define our field of present operation and inquiry as to communicable disease, subject, of course, to modification, but with probabilities in its favor.

If "the destruction of micro-organisms in living tissues is accomplished by the cells of the body and the cells only (leucocytes and phagocytes)," we may work away industriously in finding out and applying those methods of alimentation and hygiene in general which will provide healthy cell structure, which really means right blood. All the more important, because if disease has its prodroma before the arrival of micro-organisms, the best way to interrupt the preparatory condition is to do just what is also the best thing to do for the destruction of micro-organisms after they arrive.

If, however, it is not only by this process, but by that of attenuation of virus and introduction of the modified particle or its products, that the disease is to be prevented, we are to fasten attention upon this method as well as upon the living unchanged microphyte.

We thus present this brief outline of what may be regarded as the present status of opinion as to the most communicable diseases and the means by which the system attempts to combat them. Whether, in addition to our present methods of prophylaxis and treatment, we shall yet be able to obtain *immunity* by cultivating and securing a "variable quality of the virus," or *attenuation*, by a "variable quality of the infected organism," remains to be seen. In the meantime we must diligently apply the art of hygiene and the art of medical practice so far as now known, and put high value on close observation, real experience and the management and treatment that can result therefrom.

TO WHAT EXTENT DO STREAMS OF WATER THAT RECEIVE SEWAGE PURIFY THEMSELVES?

BY EZRA M. HUNT, M.D.

This question is frequently forced upon our attention from the fact that most of our city populations have or should have a public water-supply, and that a river is often the most available base of supply. Also, from the fact that all these towns need a sewer system, and that the same river or streams tributary thereto are most available for sewer outlets; if not for the one city that uses it for water-supply, at least for many others higher up on its banks. It is for this reason that there has been so much contention on this subject. It has been made of late especially prominent in this State. The Passaic river, as the great water-supply for several cities, also receives large quantities of sewage, and so has for long kept the question intimately before us. The attempt of the city of Passaic to run its sewage into the same river has more recently kept the matter fully before the courts.

In addition to this, the purchase of a sewage farm for Summit, on the banks of the river, and of the Woodruff farm, near the Rahway river, as a sewage farm for South Orange, and perhaps other towns, has given rise to zealous newpaper discussions and to very vigorous attempts to secure legislative action. In this latter case a bill to prevent the use of this farm on the ground of risk to public health, was passed by the Legislature. We have listened to the most random statements on both sides. As a rule, the fact of pollution has been overstated and the possibilities of self-purification understated.

There is always some danger in presenting both sides of this great question, since zeal and prejudice are apt to set too great value on the arguments of those who magnify self-purification. As in the case of inland towns, it almost seems necessary to have some of the sewage, or the effluent thereof, enter streams, it is fair to consider this side of the argument. On the other hand, pollution, if excessive, is so serious, and if of a specific kind, like that of secretions from typhoid fever, is so fraught with fatal peril, that we must be careful not to encourage loose views as to it.

The medium of safety is to be sought, which is all the more difficult because the question is a relative one, and is to be determined by character of river, by water-shed, by distances, by freshness of the sewage, and many other and more items than can be theoretically stated.

For these and other reasons, it is a question which should be referred to a State Board of Health, with power to act on the basis of expert testimony, of practical facts and of due examination had, the pecuniary means being provided for thorough work, and such a board charged with it as a most serious responsibility. It should then have plenary power. It is the desire of this article to state especially the most recent presentation of the matter of self-purification, because not very accessible to most of our readers. Also to refer to papers and opinions on the opposite side more within reach, and thus to show how necessary it is that such questions shall not be left to individual opinions, the action of unskilled boards, or to the riskful determination of some well-engineered legislative act.

During the past year we may notice two prominent discussions which have quite fully brought out the chief argument and allegations as to the self-purification of rivers. These have been in connection with the contest about the sewage of Munich, Germany, in its relation to the "Isar rolling rapidly," and that as to Aberdeen, Scotland, in its relation to the pollution of the river Dee. The former is well presented in a brief review in the *Sanitary Record,* April 1st, 1892, of an article in the *Gesundheits-Ingenicus, No. 4,* Munchen, February 29th, 1892: "It is well known that the views of Pettenkofer on this subject have been strenuously assailed by various men of science, and especially by Prof. Alexander Muller; and the veteran experimenter has felt himself compelled to write a pamphlet on the whole question (*Zur Schwemm-Kanalisation in Munchen*), in which he once more expounds and defends his views. Pettenkofer maintained that the investigation that had been conducted with reference to the purity of the waters of the Isar, have conclusively shown that whatever may be the true explanation of the self-purifying power of rivers, the pouring of sewage into Isar has not had the effect of polluting the river to the detriment of the towns below Munich. As a matter of fact, the water arrives at Freising, about twenty miles further down the river, in a sufficiently pure condition, and that is all, Pettenkofer holds, that need be contended for. The opponents have indeed maintained that in consequence of the employment of the flushing system at Munich, numerous bacteria, some of them pathogenic, have been introduced into the river, and that these must have the effect of increasing the number of infectious diseases in the towns further down than Munich. But, on the other hand, Prausnitz has established that the number of bacteria in the Isar becomes diminished again so largely, in the course of the flow of the river down to Freising, that it is hardly greater at the lower town than it is above Munich. The mere number of water-bacteria has, after all, according to Pettenkofer, no hygienic importance. Besides, it has been further shown, from the statistics of infectious diseases in the towns of Freising, &c., that the frequency of typhus cases in these towns does not stand in the relation of effect and cause to the number of typhus cases in Munich, seeing that there is no appreciable difference in the prevalence of typhus in the towns below the Bavarian capital, if comparison be made between the earlier period, when it was still an unhealthy town, and the present time, when it is almost completely exempt from typhus. The pathogenic bacteria are speedily conquered and killed by the water-bacteria, as is conclusively established by the researches by Eisenlohr, Emmerich, Pfeiffer and Prausnitz. Pettenkofer communicates also the view expressed to him by Professor Nageli, on the subject of the self-purification of rivers, to the effect that, in his opinion, the self-purification is due not so much to the direct taking up of organic material by the algæ, as to the decomposition of these materials by means of the increasing amount of oxygen, liberated by the algæ, and to the bacteria that live in the water. As a matter of course, if too much sewage be introduced into a comparatively small river, with only a slight fall, the injurious pollution is bound to take place, but in the case in question there is no reason to fear such a degree of pollution. Nor must we expect that the impurities will immediately disappear, since the self-purification is only a gradual process. But in the case of the Isar, at a distance of seven kilometers from the place where the sewage is discharged into the river no pollution can be shown to have taken place."

The discussion as to the river Dee arises from the complaint of the Aberdeen Town Council against the Deeside District Committee of the County Council for allowing the pollution of the water-supply at various points above the intake at Cairntown, viz., Kincardine, O'Neil, Aboyne, Ballater and Braemar. At all these places there is extensive pollutions. Mr. Gale, C.E., of Glasgow, who was appointed to make investigations, reported that the pollution was extensive, and that "the authorities at the various points complained of ought to be compelled either to prevent the pollution or to use the best means in their power to render it innocuous." Mr. Gale's own opinion is that the best and indeed only proper course to be adopted at all points would be to dispense the sewage by the irrigation method. The County Council, on the other hand, in addition to pointing out that already Braemar, in its system, has sewage-settling tanks, and that at other towns measures have been taken to render the sewage discharge harmless, transmit an able and elaborate report from Dr. Watt, the Chief District Medical Officer, in which he claims that the distance of 58 miles between Aberdeen and Braemar is amply sufficient, as proven by frequent comparisons of the Aberdeen water with others, it being, next to that of Glasgow (Loch Katrine), the best in Scotland. Prof. Carnelly, an eminent chemist, has pronounced it a "water of extraordinary organic purity." Dr. Watt calls attention to the well-ascertained power of a river to oxidize and destroy organic matter and thereby purify itself, and he points out that the peculiarly great capacity of the river Dee in this respect must be taken into account. But it is popularly believed that, although chemically, perhaps, the river can and does purify itself, yet it may be after all the carrier of germs of disease, and on this point Dr. Watt cites the high authority of Coke, who has shown that "whenever the water has a swift current, or is in a state of constant change, the conditions that are favorable to the growth of micro-organisms occur less easily, or sometimes not at all, because the continuous current prevents a localized concentration of nourishment in the fluid sufficient for the pathogenic bacteria." Dr. Watt is of the opinion, therefore, that the complaint of pollution of the river Dee at the intake has as little weight on the biological side as it is shown to have on the chemical.

Baldwin Latham, C.E., on the same general subject says: "The experience in India in connection with water-supplies taken from rivers shows that the rivers undergo a process of purification, and that the waters taken from them, after a sufficient length of flow and proper filtration, are amongst the most wholesome supplies in the country, as the case of Calcutta fully demonstrates."

The whole subject is so well presented in an article in the London *Sanitary Record*, February 1st, 1892, in review of an elaborate paper of Dr. Serafini, that we quote it in full as the best recent resume of that side of the argument:

"In the *Annali dell' Instituto d'Igene Sperimentale della R. Università di Roma, Fasicolo III.*, 1891, we find an elaborate contribution by Dr. Alessandro Serafini, to the question which is being so much discussed at the present time regarding the self-purification of water, especially of rivers. This patient investigator has conducted a long series of experiments, with the view of determining the question from a scientific standpoint, and he has come to the conclusion, expressed at the very outset of his essay, that what had long been matter of common observation has now been scientifically demonstrated, namely, that in the great majority of instances the water of rivers spontaneously and speedily purifies itself from all the refuse substances received in passing through a populous center. In support of this conclusion Dr. Serafini cites the reports, now become classic, of the English Commission, the report of Durand-Claye on the pollution and the purification of the Seine, the analyses of Schelhass-on-the-Isar, the researches of Brunner and Emmerich, also on the Isar, of Hulwa on the Oder, of Celli and Scala on the Tiber, and of many others. All of these researches have more or less completely demonstrated that the organic subetances, the ammonia, the bacteria introduced into the waters of the rivers that have been studied, diminish at a comparatively short distance from the point of pollution, while at the same time those products increase which indicate that oxidation has taken place, such as nitrous and nitric acids.

"It is true, indeed, that over against this spontaneous purification of the water of rivers have to be placed certain considerations, which may appear to modify our conclusions as to the complete spontaneity of the process, such as special local conditions, and the relation between the quantity of the pollution substances and the volume and velocity of the water of the river that is being studied. It is true, also, that some investigators, notably Alexander Müller, on the occasion of the recent discussions regarding the complete discharge of the sewage of Munich into the Isar, have shown that they are by no means convinced of such purification, especially as regards bacteria. At the same time the overwhelming evidence produced by the enormous number of experiments conducted by engineers, by chemists, by bacteriologists and by skilled hygienists, leaves no room for doubt that the self-purification of the water of rivers is an established fact.

"Assuming, then, that this has been sufficiently established, the question that is now being much studied and discussed, and regarding which very various opinions are held, is as to the process according to which such purification takes place. According to Erismann, the self-purification of rivers is due to the concurrence of these three main factors: 1. The rush of pure water and the consequent dilution of the impure substances. 2. The chemical processes which take place under the influence of the atmospheric oxygen and of micro-organisms, and perhaps also the intervention of aquatic plants. 3. The deposition of the heavy substances and the mud on the bed and on the sides of the river. Some investigators ascribe greater importance to the dilution; others to the sedimentation; others, again, to the process of oxidation; while some lay greater stress on the action of the algæ. Among those last indicated may specially be mentioned Von Pettenkofer, who during the last two years has, with characteristic enthusiasm, turned his great powers to the solution of this problem.

"With the view of determining where the truth might lie amid so many various opinions, Signor Serafini resolved to institute an independent inquiry; and he directed his attention especially to the behavior of water continually aërated as compared with that of water simply exposed, in a stagnant condition, to the action of the air. To this line of investigation he was led partly by the consideration of certain commonly-observed facts, such as, for instance, the unchanging character, and, in most cases, the potability of water continually aërated; partly by the law established by Fodor, to the effect that 'the combustion of organic substances (*cæteris paribus*) takes place with double celerity in that environment in which the air moves with double facility;' partly by the results arrived at by Emmerich in his researches on the Isar, and by Lévy and others in their researches on the Seine, in which it has been shown that the oxygen diminishes, in the rivers named, in the course of their greatest pollution. Investigations into the behavior of constantly-aërated water as compared with that of water non-aërated have not indeed been hitherto entirely wanting, but those that have been conducted have been either solely chemical, and have taken no account, therefore, of the presence of bacteria, which, as is now beyond all question, are the main factors in nitrification, and thus play the largest part in processes of purification; or such investigations have taken account of these alone, or they have otherwise been conducted in such a way as to be open to weighty objections.

"Dr. Serafini points out that the English Commission (of 1868) to which investigators owe so much in all that relates to this study of the purification of rivers, relied too much on being able to find in the movement and the consequent aëration of the water alone the cause of the self-purification, and that it limited its researches solely to the determination of the organic substances in the water, without taking account either of the behavior of the ammonia and nitrous acid, or (owing to the time at which it carried on its labors) of the bacterial contents of the water. Relying on the experiments made, the Commission attributed the slight diminution of the organic substance that was observed to the action of the free oxygen in the water. But that conclusion has little value at the present day, because, as we now know, the oxygen used in the experiments was consumed by bacteria—for which, of course, the Commission could not then, from the state of science, be on the outlook.

"The experiments in which the problem can be most advantageously studied are without doubt, according to Signor Serafini, those of Emich (1885). This author, desiring to show that in reality the processes of oxidation of the organic substances in water are due to the intervention of micro-organisms—as had already been established by A. Müller—and not at all to the action of the air, instituted a series of experiments, in which he studied simultaneously the behavior of water agitated in the presence of the atmosphere and that of water in repose—determining at the same time the organic substances, the ammonia and the nitrous and nitric acids, And from these experiments he concluded that neither the agitation of water with air, nor even that with ozone or with the peroxide of hydrogen, caused a more rapid oxidation of the organic substance of the water and consequently a more rapid self-purification. But the experiments conducted by Emich cannot be considered conclusive, in the opinion of Signor Serafini, for reasons which he gives. According to him it has not been shown by Emich that aëration does not influence the oxidation of the organic substances in water, and he proceeds to give an account with great fullness of detail of his own experiments, both with aërated and with non-aërated water, conducted in the month of July, 1890, in the Institute of Hygiene of Von Pettenkofer, in Munich. From these he concludes that the processes of self-purification take place, both in water in repose and in that which is constantly aërated, so very slowly that, as the English Commission had also concluded from its own experiments, there is no river long enough to be able to effect a complete self-purification during its course solely by means of those chemico-biological phenomena which have hitherto been taken into consideration. Dr. Serafini's researches have also shown that, in whatever way it is brought about, nitrification in water that is rich in oxygen and in bacteria proceeds very slowly, as indeed is generally allowed even by the most strenuous advocates of this view; and that the presence of the soil facilitates purification to such an extent that it may with much probability be maintained that in the processes of nitrification, which take place in rivers and even in wells, the presence of the soil represents the principal of these; that is to say, that such process takes place mainly, not in the mass of the water, but in the bed of the river. As regards the bacteria, it has been proved that these multiply indifferently in water continually aërated and in that which is simply in contact with the air at the surface, and, consequently, continual aëration does not exercise, even under this point of view, any influence whatever on the purification of rivers. On the other hand, Dr. Serafini's experiments have shown that a noxious influence is exercised by a low temperature, and also by the rapid passage of the bacteria from a warmer environment, and one richer in nutritive substances, into one that is characterized by the contrary properties. A constantly-observable result has also been the tendency of the bacteria to deposit themselves at the bottom of the water.

"Sig. Serafini sums up the conclusions he has arrived at from his experiments as follows:

"1. Aëration, continually kept up by the renewal of the air, in no way impedes the development of micro-organisms in water; and even if it be beyond all doubt that the presence of air is indispensable for the processes of oxidation of the organic substances caused by bacteria, yet, all the same, the continual aëration does not contribute, *per se*, to the acceleration of such processes. In fact no appreciable and constant difference has been observed between a water in which the air has been renewed, as happens in rivers, and a water in which aëration has taken place under the influence of temperature and of pressure by the simple contact of the surface with the surrounding air.

"2. In accordance with what the English Commission had observed, the transformation of organic substances in water proceeds so slowly that it cannot be completed by means merely of the volume of water, even in the entire course of a river, and much less within the limited space and in the brief time that are, as a matter of fact, available; and even if it cannot be denied that nitrification is due to the presence of bacteria in the water, yet this can be appreciably observed only at what is relatively a very slow rate, in water in which this process takes place naturally, and with extreme slowness in water that has been artificially polluted, whether such waters are in simple contact with the air at their surface or whether they have been for several days actively and continuously aërated throughout the whole of their mass. It appears, also, from the experiments, that the micro-organisms find, in the presence of the soil in the water, conditions which favor the development of their nitrificating properties, and consequently we must hold that such processes of nitrification in rivers are carried on principally in the beds. The action of light does not exercise, *per se*, any influence on the transformation of organic substances in water, but rather, by causing the more or less rapid death of the bacteria, impedes it.

"3. The action of temperatures near to 10° C. and lower than 6° C. undoubtedly effects the death of many bacteria in water, and arrests the development of others, as is proved, also, by the smaller number of these in rivers during winter.

"4. It appears, besides that, if there be not present the contrary influence of a highly favorable temperature, water in great volume exercises, *per se*, a noxious influence on micro-organisms which may have reached it from surroundings more favorable to their existence.

"5. Equally under experimental and under natural conditions—reference being had, that is, to rivers with a high velocity—there takes place in large masses of water a gradual and continuous sedimentation of bacteria, which is also favored by the deposition of the other substances suspended in the water.

"6. From these results, therefore, and on account of the considerations that have been brought forward in the course of his article, Signor Serafini is of opinion that the self-purification which, under favorable conditions, is observed in rivers, does not take place by means of processes of oxidation in the mere volume of water, but that it is due to a complex variety of factors. To sedimentation, to dilution, to the mechanical action of suspended substances which are deposited on the bottom, to movement of the waters, to low temperature, to superficial filtration on the bed of the river, and perhaps, also, to a certain action of the water, *per se*, is due the rapid diminution of the bacteria which are contributed to rivers by sewage; and to sedimentation, to dilution, and to slow and continued processes of oxidation in the bed of the river, is due the self-purification from organic substances and from the intermediate products of their decomposition in suspension and in solution in water. The water, flowing on the bed of the river, sets free the nitrites and the nitrates which are formed in the zone in which sedimentation gradually takes place; and, consequently, while by means of sedimentation and dilution there comes about the continuous and rapid diminution of organic substances and of ammonia, this is accompanied by the rapid and continuous increase in the water of nitrites and especially of nitrates—that is, that entire complexity of changes which, with the simultaneous diminution of bacteria, we designate by the term self-purification of water."

In addition to this there are those who claim that èven if water comes from streams more or less impure, by means of chemicals, of the infusion of compressed oxygen or air and especially by methods of filtration, it can be rendered pure. It is true that filtration can do much, and the Massachusetts experiments have thrown some new light on filtering material and methods and upon our ability to improve drinking-water. We quote as follows from a recent article by Prof. A. R. Leeds:

"Some six years ago there was, I think, but one city in the United States which attempted to filter its water, and that was Poughkeepsie, on the Hudson. At the present day there are more than one hundred, and the practice is increasing very rapidly. In England, and on the continent of Europe, the practice of filtration is well-nigh universal. Some five years ago Jersey City and Newark, in New Jersey, requested me to visit the various water-supplies, in England more especially, to study this matter of filtration of their waters, and I found that all great cities, with the exception of Glasgow, filtered their water-supplies. The most conspicuous example is London, with its population of five and a half millions of people. Its water-supply is almost entirely taken from the river Thames, and that river receives the drainage of a very great population. The towns are compelled, by act of Parliament, to purify their sewage to a certain point, but a great deal of filth finds its way into the Thames. By act of Parliament the several water companies that supply London are compelled to filter their water; and to effect that object they have filter basins that cover more than a hundred acres in area. Their method of filtration is to run the water into large reservoirs containing sand. The sand that does the filtering is about two feet in depth and supported on a substratum of coarse stone. As the filth is removed it accumulates in a thin layer upon the top of the sand; and when the water—which filters only under the pressure of the four feet, or thereabouts, of water standing in the reservoir—filters too slowly, they are compelled to send a force of men into the filter basin shovel off the top layer of sand and dirt, remove it, wash it and restore it to the filter-bed. The same plan is followed at Berlin and other great cities on the continent.

"*How the Filter-Beds do Their Work.*—It is easy to see how they remove the dirt, the gravel and the suspended matter; but how do these shallow basins of sand remove the living organisms—those organisms with which you are all so familiar under the name of bacteria; those organisms which, when they produce typhoid and other fevers, are known as disease germs? That operation was a complete mystery until the last four or five years. But few people had ever seen or examined the bacteria before that period. It is entirely a new topic in this country, and the method by which they are removed from the waters was a profound mystery. It has now been shown that the bacteria remove the bacteria. The bacteria in the waters are comparatively few of a dangerous character; the great bulk of them are our greatest friends. It is through their aid, together with the oxygen of the air, that the filth in the water is destroyed. They feed upon it and they feed upon each other. Since that knowledge has been obtained, the object now is to cultivate the bacteria. In order to make the filter-bed do its work effectively, it is necessary that the growth of the bacteria shall be facilitated until a filter-bed becomes populated with an incredible number of them. As the result of their activity they multiply themselves in vast numbers; and they form at the top of the filter-beds and between particles of sand a sort of jelly or slime—a bacteria jelly; and it is by the aid of this bacteria jelly that the bacteria in the unfiltered water are removed. The bacteria come down into the pores of the filter, when they are caught by this jelly, and they are consumed. And if the rate of movement of the water is slow enough it is possible to begin with water like that of the river Spree, which is a portion of the water-supply of Berlin, containing 100,000 of bacteria to the cubic centimeter, and after passing through one of the filter-beds the water which comes out will contain but forty or fifty bacteria. This takes place when the rate of filtration is such that 1,000,000 gallons of water pass through those filter-beds per acre in twenty-four hours. If the rate is diminished until only 300,000 gallons pass through in that interval, the bacteria can be diminished until there are only five or ten per cubic centimeter. But this rate is too slow to permit of an economical use of the filter-beds, and the consequence is that the authorities of Berlin require that the water shall pass through the filter-beds at the rate of 1,000,000 gallons per acre in twenty-four hours. The interesting fact is thus brought out that some of the foulest water, most polluted with sewage, is so filtered at the present day in the capital of Germany; the filtered water is submitted to the most searching criticism of Professor Koch, whose institute of hygiene is there, and to whose labor our knowledge on this subject is mostly due, and that this foulest of water is there taken, filtered and then becomes the water-supply of Berlin. If we can do as well or better than that, we have every reason to be satisfied that we are on the side of safety."

Several companies interested in patented filters have recently combined, and are urging these methods of purification.

On the other side of the question we may refer to the report of the committee of the American Public Health Association as made by Surgeon Smart, 1887 and 1888. From that of 1888 we quote as follows:

"In its report at the last meeting of the Association your committee explained in brief the ground of its belief in the harmfulness of sewage in waters used as potable supplies, whether these were derived from wells or larger sources, whether the water-supply of an isolated dwelling or that of a populous city. Chemical analysis was shown to be in most instances inadequate to the detection of sewage, unless the sewage was present in unusual quantity, or the water unusually free from other organic matters; and the conclusion was reached that the inability of the chemical methods is of no practical importance, as the presence of sewage in the water-supply can be determined by the Sanitary Inspector; and further, that for protective purposes the knowledge that sewage enters the water is all that seems to be required, because where there is sewage there is danger of typhoid infection.

"Your committee desires to give special emphasis to the last-stated clause, because it believes that the endemicity of typhoid fever in our cities is in great part due to the sewage in the water-supply.

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"The efforts that have been made from time to time to quiet the public mind by demonstrating the destruction of sewage and the self-purification of the water which contained it, are in part attributable to financial interests; but only in part, for many sanitary inquirers have been deceived by partial or imperfect observations. Unfortunately, however, those analysts who have had much practical experience in following the track of sewage in its passage down-stream recognize in this so-called self-purification only the results of sedimentation and dilution. Undoubtedly the natural processes of purification—the transformation of organic matter into ammonia, and the nitrification of the latter—operate in the current of a running stream; but these account for but a small proportion of the seeming purification, and there is no ground for supposing that the infectious principle of typhoid fever is given up to the action of these purifying agencies. We acknowledge that typhoid fever is propagated by an infected sewage in a well-water when all organic trace of the sewage has disappeared through the instrumentality of the agencies referred to.

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"Although the general tendency is to the reduction of organic matter in stored waters, it often happens, particularly if the water is rich in ammonia or easily-decomposed albuminoids, that vegetable growths other than bacteria will be developed, giving a bad taste or odor to the water, and perhaps causing diarrhœa in the consumers. These, which may be considered the accidents of storage, have been studied by many Health Boards and water companies; and the influence of heat, aëration, exposure to sunlight, &c., on their development, has been determined with practical benefit in many cases.

"Sedimentation is sometimes an exceedingly slow process, particularly when the mineral particles consist of finely-divided clay. A week or more is required in some instances to give a clear water, and this involves a large expenditure for storage basins. Hence, many have turned their thoughts to filtration as a prompt and efficient means of purification. Filtering-beds are in general use in England, but in this country they have been constructed only by a few cities, and in an experimental way. The results do not appear to have been satisfactory. The expenses attending them are large, and the coldness of our winters begets difficulties which have not to be encountered in the milder climate of England.

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"In the efforts to attain to a prompt and efficient method of purifying water by sedimentation or filtration, with or without the use of precipitants, it is of the utmost importance that the object of the purification be kept steadily in view lest we fall into the error of supposing that the end has been accomplished when a clear water has been obtained. The agents, of a certain patent filter, place in the show windows of some prominent store two companion glass jars, one filled with an opaque and discolored turbidity overlying a stratum of heavy sediment, and labeled 'Water taken this morning from the public mains;' the other, sparkling like a consolidation of dew-drops, and labeled 'The public water after passing through so-and-so's filter.' A glance at these gratifies the passer-by, by seeming to instill into his mind so much sanitary knowledge. They sow seeds of reflection which develop and multiply with bacterial fecundity, so that in a few minutes they have done the work of an octavo pamphlet on 'Potable water: its impurities and the methods by which they are removed.' But the sparkle of the filtered water, although honest in itself, hides a fallacy which undermines the whole of the suggested argument. It must be remembered that clear waters are not necessarily wholesome waters. Their sparkle is no proof of their purity. From the laundresses' point of view, or the paper-makers', the result is satisfactory; but the object of the filtration of a water-supply for domestic or public service is its wholesomeness when used for drinking, and its transparency gives no testimony on this subject.

"During sedimentation the heavier and grosser particles of mineral matter readily subside, and carry down with them much of the flocculent organic matter which would otherwise continue in suspension for many days.

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"It must be remembered that it is only organic matter in a state of decay that is thus reduced to the inorganic condition, and only organic matter in a tangible form that is thus carried down by the heavier particles of the mineral sediment. Organic matters that are endowed with vitality remain uninfluenced by the destructive and reconstructive bacterial agencies that are operating in the water; and these, as has been seen, are the matters from which most is to be feared if sewage has unfortunately had access to the supply. The infected water which prostrated 1,200 of the 8,000 inhabitants of Plymouth, Pa., and killed 130 of those whom it prostrated, passed through three storage reservoirs on its way to accomplish its deadly mission.

"Nor is filtration more efficient as a purifier when viewed from the standpoint which sees typhoid fever disseminated by an infected sewage in the water-supply. A satisfactory filtration removes the haze or cloudiness which may pervade a sedimented water for days after the grosser particles have subsided, and in so far its results are better than those generally effected by sedimentatian. The finer particles of clay, some no larger than barely distinguishable molecules under the ordinary working powers of the microscope, are removed, and with them organic shreds of similarly minute size, and even many of the bacterial germs which were present. A water thus freed from foreign matter in suspension seems to offer the luster of its transparency as a voucher or visible symbol of its purity, and chemical analysis may show in it only the merest trace of organic matter in solution, for the processes of decomposition and recomposition of the organic elements take place with much greater rapidity when the water percolates through the pores of the soil, as in the natural process of filtration, than when it is merely stagnant in a reservoir or flowing in the current of a stream.

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"Since natural filtration is powerless against the infection of typhoid, it is evident that artificial methods can give no guaranty of protection.

"The purifying influence of precipitation by means of such chemicals as alum, iron or lime can readily be demonstrated by chemical analysis. The hydrated alumina, ferric oxide and lime carbonate, as they materialize into particulate existence from their solution in the water, entangle and carry down with them organic particles that would otherwise be less easily removed; and biological research shows that bacterial germs are swept from the water in like manner. That this operation is imperfect is demonstrated by the number of colonies which can be developed from the cleared water; that it is purely mechanical and not germicidal is indicated by our experimental knowledge of the action of such substances on various bacterial organisms, and by the fact that their presence does not exercise even an antiseptic influence on the bacteria of the water, as the number of these bacteria subsequently increases in the cleared water as rapidly as in a stored water which has had no such chemical treatment. The commercial interests concerned in artificial filtration invest these substances with the title of coagulants, as if the albuminoid constituents of inorganic life curdled into a bacterial *rigor mortis* as soon as the water became pervaded with the presence of the precipitant; but there is no warrant for a belief in any protective virtue other than that connected with a mechanical entanglement and precipitation.

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"In view of the considerations which we have thus briefly reviewed, we cite the opinion of the English Commissioners, to give it greater emphasis as re-affirmed after the passage of years which have added much to our knowledge of the propagation of infectious diseases by means of the water-supply: 'Of all the processes which have been proposed for the purification of water or of water polluted by excrementitious matters, there is not one which is sufficiently effective to warrant the use, for dietetic purposes, of water which has been so contaminated. In our own opinion, therefore, rivers which have received sewage, even if that sewage has been purified before its discharge, are not safe sources of potable water.'"

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The Association adopted the following resolution:

"*Resolved*, That it is the well-considered belief of this Association that it is an imperative necessity, especially in the more populous States, that State Legislatures should give their Boards of Health that financial support which would enable them to act intelligently on all questions pertaining to the public water-supplies, investing them at the same time with the supervision of the said supplies, and with power to preserve these waters from contamination by sewage or other injurious matters.

"CHARLES SMART,
"S. W. ABBOTT,
"G. C. ASHMUN,
"W. W. DANIELLS,
"EDWARD PLAYTER."

Many similar views might be quoted.

Amid these apparent contradictions, it is not surprising that the public should be puzzled, or that arguments should constantly be presented on either side. Theoretically, all air that is breathed and all water that is drunk should be absolutely pure. This cannot be true in either case. Wherever persons are collected in a room or assembly, the absolute purity of the air is impossible. So true is this that we do not expect in ordinary life to secure perfect purity, but only state by a fraction the degree of impurity as measured by the carbonic dioxide which is permissible. With this as our standard, we seek to attain thereto, but nevertheless, knowingly and almost by necessity are placing ourselves in crowds, or in large assemblies, or amid air that has organic matter in it. We do not expect to suffer therefrom if only we avoid, as far as we can, these conditions; if we do not subject ourselves to them when out of health, or if we compensate for the temporary necessity by general maintenance of ventilation. The same precisely is true as to water-supplies. We aim at purity; we learn to ascertain the risks of organic and inorganic matters in water, the special relations of animal, vegetable or mineral matters, the effect of micro-organisms, which of them are useful, which of them represent specific disease, and what are the ordinary risks incident to matter in the state of change. We reckon the influence of river-beds, of quantity of water and rapidity of streams, the effects of temperature, the character and amount of the sewage or other effete matter introduced; in a word, we take into view the absolute law and all modifying factors and conditions and the safe limits of use, and upon these base our practical directions.

From all this it is easy to see that, with general principles to guide us, *each water-supply is a study by itself*, and that it is by a special knowledge as to it that we are to determine its fitness for use. Science and experience are constantly adding new facts, and there is not so much doubt as might be imagined from the conflicts of opinion to which we have alluded.

As a summary of our own views as to how we are to secure safe water-supplies in this State, we give the following suggestions:

First. Every public water-supply should have inspection, say for thirty miles or more, above its intake, and Boards of Health should know just what enters into it.

Second. In any case the introduction of dead animal matter in bulk, or of any sewage which has been impounded in cesspools or elsewhere and is not fresh, should be prevented.

Third. As a rule, sewage from towns should be purified by land or chemical methods before entrance into streams.

Fourth. The purity of water should be from time to time tested.

Fifth. Artificial methods of filtration or purification should, if needful, be adopted.

Sixth. A State Health Board should have the authority to investigate, to determine the required purity of all effluents, and, in general, to decide, subject to proper review of the highest court, the standard of purity required, and to prevent any pollution it may deem hazardous to health, as also in any proposals for sewering into rivers now used for potable water-supply to decide as to the same.

SANITARY PROGRESS, ESPECIALLY IN NEW JERSEY.

ADDRESS BY E. L. B. GODFREY, A.M., M.D., CAMDEN, N. J., PRESIDENT OF THE NEW JERSEY SANITARY ASSOCIATION.

We have assembled again in this the eighteenth annual meeting of the New Jersey Sanitary Association, to discuss the vital questions belonging to sanitation. The subject is one of deep importance to the Association and to the State, for it means no less than the proper care of the public health.

Sanitation is one of the important questions for government consideration. Next to the moral welfare of a community lies its physical well-being, which constitutes, in a large measure, the basis of its prosperity. In the health of every subject the State is interested; and in the relationship existing between individuals it has the right to guard the interests of the community. The State should look to the preservation of the lives of its people from preventable causes of disease and death. And since the welfare of one State depends in a large measure upon that of every other State, in its health as well as in its political and commercial relations, it is imperative that there should be uniform health laws, especially in relation to quarantine. These laws should be supreme throughout the country, and should apply in all emergencies and to all causes of domestic and foreign pestilence. The yellow fever epidemic of 1886 and the late cholera endemic in New York harbor show the necessity of this. In addition, the State, as the ultimate source of power, and on account of its vast resources, should collect, record and analyze vital statistics; arrange the facts relating to human life under different circumstances; determine their effects, and distribute, for the welfare of its subjects, the information upon which the science of preventive medicine can be best erected. To execute the health laws of the General Government; to collect and classify vital statistics; to publish and distribute the facts essential to sanitary progress, there should be, as has been suggested by the American Medical Association, a Cabinet officer known as Secretary of Public Health.

SANITARY PROGRESS IN EUROPE AND AMERICA.

But before passing to the record of sanitary progress in New Jersey, the subject about which I propose to speak to-night, take with me a glimpse of its course in European countries and America. Sanitary progress has been of slow growth at home and abroad. The fearful plagues of mediæval English and Continental history seem to have been met in a spirit of fatalism, and to have literally devoured their way through Europe, until nothing remained for them to feed upon. Medical skill, in those days, was unable to cope with the overwhelming odds of universal ignorance and disregard of the simplest laws of sanitation. But here and there arose bright lights which dispelled the dense clouds of stupidity and superstitious fears. Like living sentinels, there stand forth the names of prominent physicians who risked, in the cause of public health, their reputation and often their lives.

In 1854, the fearful death-rate resulting from the unsanitary condition of the English army in the Crimean War, shocked the civilized world, and aroused England to the necessity of sweeping reforms. These reforms, effected largely through the exertions of Florence Nightingale, reduced the mortality in the hospitals of the Crimea from 60 per cent. to a little above 2 per cent. Rarely, indeed, have the principles of sanitary science been better illustrated. It was not, however, until 1875 that England codified under one law all previous sanitary legislation, and established the Local Government Board as a central authority in matters of public health.

The recognition of the germ theory of disease marked a new epoch in sanitary methods. The sanitary laws of England are now of a high character, and, in some respects, models for us. The late cholera epidemic tested the power of the London health officials to prevent the introduction of the pest into one of the worst hot-beds of disease in the world, the East End of London, and with successful results.

Owing to her changing political history, and to her lack of educational facilities among the lower classes, France has, perhaps, made less rapid progress in sanitation than England. Her advance during the past century is marked, and the present health laws are better than in some of her neighboring countries. Councils of Public Health are organized throughout France and act in conjunction with the police. It is only too plain, however, that the municipal authorities of Paris and Havre were unable to deal with the recent cholera invasion as promptly and decisively as the occasion demanded.

In Germany, the health regulations are matters of interest to the Kaiser, who, by reason of his military authority, should be able to enforce existing laws. Scientific interest is shown in the etiology and prevention of disease, and the names of Virchow, Koch and others are highly revered by the educated classes of the empire.

But all Continental nations have to fight against the ancient and faulty construction of the older cities, and the superstitious ignorance of the lower classes. It is difficult to teach the necessity of isolation and disinfection, and the risk of contamination from commercial traffic. The recent terrible mortality from cholera at Hamburg, the high death-rate at Paris, and the panic in Berlin were mainly due to the fact that these cities, built on sluggish rivers and permeated with canals, contain a large population, living on the edge of these colossal drains, or in barges floating on their surface, who persist in drinking and using the river-water, saturated with infection.

Fortunately for America, and especially for the United States, many of the complex hindrances to thorough sanitation which exist in Europe, because of its ancient civilization and mediæval traditions, are wanting here. Our faults are those of youth and inexperience; our space is more ample; our population less dense and better educated; our material and financial resources are on so much broader and more luxuriant a scale, that, as a nation, we have, so far, much less cause for fear than our European and Asiatic neighbors.

Our sanitary history is nearly contemporaneous with our Constitution. In 1793, Dr. Benjamin Rush, the distinguished patriot and the most influential American surgeon of his day, gave an impetus to it by the methods he employed in subduing the yellow fever epidemic that prevailed in Philadelphia in that year. In 1799, the quarantine laws established by the different States were ordered by the government to be observed by the United States Marine Service. But little, however, was accomplished in the cause of sanitary progress until 1850, when the Legislature of Massachusetts ordered the report of the Sanitary Commission of that State to be printed for distribution. In 1857, a National Quarantine Convention was called to assemble in Philadelphia. This was the first sanitary convention held in this country, and proved so popular that subsequent conventions were held in Baltimore in 1858, in New York in 1859, and in Boston in 1860. The Boston convention was the last, probably on account of the beginning of hostilities between the States.

During the war, 1860–64, decided advances were made in sanitary matters. The lesson of sanitary neglect taught England during the Crimean War, and the wonderful work of Florence Nightingale, were not lost on the United States in their hour of conflict. Camp policing and hospital management made sanitary education imperative and national. The necessities of the hour gave rise to the American Sanitary and Christian Commission and the Western Sanitary Commission of the North, and the Wayside Hospital Service of the South. The work accomplished by these organizations was of vast assistance to the Medical Department of both armies.

In 1869 the first State Board of Health was appointed in Massachusetts. In 1872 the American Public Health Association was organized, and the discussions, at its annual meetings, by sanitarians from all parts of the country, gave a decided impetus to sanitary progress. In 1873 the Section of State Medicine was instituted in the American Medical Association, which was itself organized in 1847. The establishment of Boards of Health in the different States, and of Local Boards in cities and towns, has gradually followed the widening growth of sanitary education. The necessity of national health laws has, of late, been clearly demonstrated, but their early enactment rests with the people rather than with the politicians. But the slow work of educating the people in sanitation will go on "without haste, without rest."

> "Science moves, but slowly, slowly,
> Creeping on from point to point."

Its progress rests upon the understanding of vital facts which, in time, will become as familiar as the alphabet.

SANITARY PROGRESS IN NEW JERSEY.

In the drama of sanitary progress, New Jersey has played a conspicuous part. In 1799 the first legislative act relating to sanitary science was passed. The act provided for the security of the citizens of the State against the introduction of contagious diseases, and gave the Governor plenary powers to prevent communication of citizens with vessels infected with contagious diseases, and lying in the Hudson or Delaware rivers, when the officers of the vessels were disposed to evade the quarantine laws of New York or Pennsylvania.

In 1812 an act was passed to prevent the introduction of malignant diseases into Perth Amboy, which act provided that vessels arriving between the last of May and the first of October from parts infected with yellow fever should be quarantined. But little had then been accomplished by the State in the way of sanitary progress. Before organized sanitary work could be undertaken, it was necessary to procure legislative support.

In 1866 the first definite movement was made in this direction. Early in that year, Dr. Ezra M. Hunt, the present Secretary of the State Board of Health, conferred with Dr. Samuel Lilly, a member of the Court of Errors and an ex-President of the Medical Society of New Jersey, as to the feasibility of a State Sanitary Commission. They presented the matter to Governor Marcus L. Ward, who approved of it and invited several members of the Legislature to a conference. This resulted in the passage of an act of Legislature creating a Sanitary Commission, which was approved by Governor Ward. He appointed Dr. Ezra M. Hunt, Metuchen, President; Dr. James B. Coleman, Trenton, Secretary, and Drs. Richard M. Cooper, of Camden, Thomas Ryerson, of Newton, and Isaac A. Nichols, of Newark, as members of the Commission. The Commission were requested to furnish the Governor, at as early a date as practicable, with "such information and advice as they might deem important in reference to Asiatic cholera." They entered at once upon their duties with special reference to cholera, then prevailing as an epidemic. The President, Dr. Hunt, was called into service a number of times in cases of sporadic cholera. The Commission embodied in a letter to Governor Ward important advice concerning cholera, which was extensively published by the press of the State. This attracted public attention, and educated both press and public as to the course and prevention of the disease. The Commission insisted that commercial highways, along which cholera prevails, should be guarded, and asked for certain restrictions, which were not given until a second letter was published. By judicious management, cholera did not become generally epidemic, but so far as the Commission were able to ascertain, there were two hundred fatal cases in the State.

In 1867 the Commission presented a report to the Legislature, which included the consideration of (1) cholera, (2) the general sanitary condition of the State, (3) epidemic and contagious diseases, (4) vaccination, (5) the insane, (6) the condition of poor-houses, (7) vital statistics and (8) workshops and workmen. .The subject of cholera received close attention in the report, and the portability of the disease, as well as the effect of disinfectants and of sanitary laws on its propagation, were ably set forth. The Commission also suggested, what is now in operation, that every city and town in the State should have its Local Board of Health, vested with power to determine what constitutes a nuisance, and with authority to remove the same. The report also presented the need of laws relating to contagious diseases, and suggested that vaccination of school children be made obligatory, and, for the indigent, gratuitous; that accurate and classified statistics of the insane and idiotic be prepared; that the feeble-minded be separated from the demented; that a statist be appointed to properly collect, arrange and record vital statistics; that employers should protect employes against overcrowding, bad ventilation, &c., in factories and workshops, and that a general health code be enacted. The duties of the Commission were not meant to be final, but introductory, and suggestive of future enlightened action.

With the disappearance of cholera the Commission was dissolved, since the Legislature did not deem a permanent Commission necessary. But a good foundation had been laid; public interest had been aroused. The subject of public health and statistical record was pressed upon medical attention from time to time by Dr. Hunt. In this work Surgeon-General Varick and Drs. Richard M. Cooper, Lewis W. Oakley, William Elmer, Franklin Gauntt and others took an active interest and helped to pave the way to subsequent State action.

It was not, however, until 1874 that further legislative effort was made. Then Dr. Hunt and others asked the Legislature to appoint a Health Commission "to examine into the sanitary needs of the State, into any defects of existing laws bearing upon the prevention of disease, and, in general, to inquire what ought to be done by the State towards conserving the physical welfare of its citizens." This request was complied with, and a second Health Commission was appointed by the Governor, at the expense of $100. It was composed of the following gentlemen: Dr. Ezra M. Hunt, Chairman; James R. Mercien, Jersey City; Dr. Samuel Lilly, Lambertville; Prof. George H. Cook, New Brunswick; Dr. William Elmer, Trenton, and Dr. Lewis W. Oakley, Elizabeth. The Commission presented a report prepared by Dr. Hunt, published in the spring of 1875 and extensively distributed throughout the State, which greatly increased popular interest in sanitary matters. In this elaborate report the Commission defined the object and effect of sanitary laws, claiming that they should not alone be mandatory, but instructive and regulative, and that the enforcement of such laws is in itself an education. The Commission discussed contagious diseases, drainage, water-supply, sewerage, garbage and ventilation, from a legislative standpoint, as to their abatable conditions. They reported, in conclusion, the need of actual facts as to our hygienic condition, and recommended that (1) vital statistics include not only the number, but the cause of death; that (2) the State should look after the public health and diffuse sanitary information; that (3) there should be a central Council of Sanitarians, which should take charge of vital statistics and suggest, from time to time, to the Legislature new sanitary laws, and that more stringent laws should be enacted to protect citizens from nuisances and sources of disease. In June the Commission issued a circular containing inquiries about various sanitary matters and addressed to both physicians and laymen throughout the State, asking for such co-operation as to enable them to judge of the sanitary needs of the State. The answers received satisfied the Commission of the need of wider knowledge in public health matters.

On September 24th, 1875, a call was issued for a sanitary meeting at Newark, for October 13th. At this meeting there were delegates present from Orange, Elizabeth, Belleville, Hackensack, Jersey City, Rahway, Passaic, Metuchen, Trenton, Bloomfield and Montclair. The convention was called to order by Dr. S. B. Hunt, of Newark. A temporary organization was effected by the election of Dr. Stephen Wickes, of Orange, Chairman, and Dr. S. B. Hunt, of Newark, Secretary. The permanent officers for the session were Dr. Samuel H. Pennington, of Newark, President; Drs. J. Henry Stone, Rahway; Franklin Gauntt, Burlington; Alfred Mills, Morristown; Henry A. Hopper, Hackensack, and A. N. Dougherty, of Newark, Vice Presidents; George Werts, of Paterson, Secretary, and Drs. Ezra M.

Hunt, I. A. Nichols and Lewis W. Oakley, members of the Executive Committee. The following papers were read: "Atmospheric Humidity in Relation to Sewerage and Drainage," by Dr. S. B. Hunt; "Removal of Milldams and Construction of Sewers at Rahway," by Dr. J. K. Shotwell; "General Principles of Drainage, Sewerage and Water-Supply," by General E. L. Vielè; "Types of Diseases at Burlington," by Dr. Franklin Gauntt; and "Water-Supply of Jersey City and Adjacent Towns," by Prof. A. R. Leeds. The address of Dr. Pennington was received with much favor and printed in full, with the transactions of the convention, in the *Newark Daily Advertiser* of October 14th. The following resolutions were adopted:

"That the members of this Association at once proceed to the formation of sanitary associations in their respective localities."

"That the subject of State water-supply be commended to the consideration of these local societies."

"That a committee of five be appointed to report next year on the subject of water-supply."

Prof. Leeds, Gen. Vielè, Albert Beach and Drs. Pinkham and Bodine were appointed on the committee. The permanent officers elected for the ensuing year were Prof. George H. Cook, New Brunswick, President; Dr. I. A. Nichols, Newark, First Vice President; Dr. John A. Stearns, Trenton, Second Vice President; Mr. George Werts, Passaic, Recording Secretary; Dr. Ezra M. Hunt, Metuchen, Corresponding Secretary, and Dr. Samuel H. Pennington, Newark, Treasurer. The Executive Council consisted of Drs. S. B. Hunt, W. P. Lyman, L. S. Dennis, Senator Potts, Frederick Bourquin and Dr. Franklin Gauntt. The convention adjourned to meet at New Brunswick in the following year. From the first, it met with the favor of the sanitarians, and to-day, as the New Jersey Sanitary Association, it is one of the influential forces of the State.

No legislative action was asked for at either of these meetings, or obtained by the convention. But the Corresponding Secretary, Dr. E. M. Hunt, untiring in his efforts to further the cause of sanitation, visited Europe in 1876 in company with Surgeon-Major John S. Billings, U.S.A., for the purpose of inspecting hospitals and of studying sanitary questions. Returning in January, 1877, profoundly impressed with the sanitary needs of our State, he conferred with Senator George C. Ludlow, who introduced and supported a bill to

Establish a State Board of Health, which was approved March 31st, 1877. The bill met with favor in the Senate, but encountered such opposition in the House as to require a presentation of all the facts in evidence to secure its passage.

Governor Bedle approved of the bill and expressed anxiety to appoint those who would give the measure success. The following persons were appointed members of the Board: Ezra M. Hunt, M.D., E. J. Marsh, M.D., Ezra A. Osborn, C.E., Laban Dennis, M.D., Prof. Cyrus F. Brackett, James M. Ridge, M.D., Theodore R. Varick, M.D., and Hon. Henry C. Kelsey and Hon. John P. Stockton, *ex-officio.* In May, 1877, the organization of the Board was effected and the plan of a Department of Health and Vital Statistics was thus outlined and authorized.

The original bill did not include vital statistics, because this subject was not well understood. To secure this a conference was held the next year between Dr. E. M. Hunt, Dr. E. J. Marsh, Hon. George C. Ludlow, Hon. William Magie, Hon. G. A. Hobart and Hon. F. A. Potts, which resulted in a special bill as to vital statistics and in the securing of its passage.

The Board, from the first, took a wide and comprehensive view of its sphere and privileges. A critical examination of its reports and circulars shows that a definite plan was pursued, which was the diffusion of sanitary information, first among the members of the medical profession, and second, among the people. Next to physicians, the Board enlisted the interest of civil engineers, teachers, architects, chemists, plumbers and members of other allied callings. Even the agricultural population was reached through information given concerning the care of animals in contagious diseases. By its reports and circulars, by the use of the press, by conferences with Boards of Trade, Local Boards of Health, Common Councils and Mayors of cities, and by talks on sanitary subjects, the Board has educated a sentiment throughout the State so favorable to sanitary progress that the laws relating to public health have been revolutionized. In the accomplishment of this the New Jersey Sanitary Association, whose transactions the Board of Health has published from year to year, materially assisted.

Having considered the history of the organization of the State Board of Health and that of the New Jersey Sanitary Association, let us inquire more specifically what each has accomplished in the matter of sanitary progress.

The State Board of Health has had a distinctive plan from the first. This plan, as stated, has been educative in all of the branches and bearings of sanitary science. Besides the education of the people, the Board secured a series of laws, which gave necessary powers; provided for the organization of Local Boards of Health; determined definitely their sphere of action, and provided for the return and the recording of vital statistics from the cities and townships of the State. Its code of sanitary laws is not excelled by that of any other State. The record of the progress of the Board may be found in its sixteen annual reports; in its eighty circulars; its Inspector's Guide; in the score of laws passed, and in its consolidation of various acts in the health laws of 1886, 1887 and 1888. Its course has been steadily progressive, as the original laws with their additions, alterations and enlargements, plainly show. Its progress has been difficult, because all legal precedents of the State were in favor of common law, and the slow methods of indictments by jury system. Sanitary law and administration can only be successful with police and summary methods. This principle the Board strenuously urged. In 1879, the Secretary, Dr. E. M. Hunt, read an address before a legislative commission, consisting of Hon. Barker Gummere and Hon. William Magie, and obtained the admission that this principle was necessary and right, although the decisions of the courts and precedents were against it. They advised the Board, through the Secretary, to persevere and establish a precedent. To do this, it was necessary to overthrow the old custom of Boards of Health being committees of Common Council, or deriving their powers from indictment by grand juries, and to gain for local Boards of Health power to define nuisances and to provide for their abatement without judicial proceedings. In the case of the City of Camden *v.* Hutton, the Court of Errors declared that the Health Boards had no power to decide as to nuisances. The changes in the laws since then, by which the Board of Health has gained this power, present a striking contrast.

The reports and special circulars of the State Board of Health educated popular sentiment in its behalf and contributed much to these changes in the law. No sanitary subject seems to have escaped practical consideration in these reports. With the public enlightened, the importance of sanitary science became quickly appreciated. Provision has been made for a Health Board in every city, town and township, supported by legislative acts, which give each Board full power to pass, alter, amend and enforce ordinances on fifteen sanitary subjects, besides general power over all nuisances. The work of the State Board is largely educational and advisory; that of the Local Boards, administrative. This completed the entire system of sanitary jurisprudence for the State, except in Hudson county, where the law has many of its functions also exercised by a County Board.

Having briefly considered the work accomplished by the State Board of Health, let us now inquire what further should be done to increase our sanitary interests. But little, it may be said, except to preserve the law in its entirety, and to protect it from disturbing legislation. This requires watchfulness on the part of the State Board, and of this Association, in order to prevent the enactment of crude laws which would disturb the general system. Defects are few in the State law. Judge Lanning says: "We do not so much need additional legislation by the State as additional and intelligent legislation by Local Boards of Health. For this the State law amply provides in powers delegated to them for the passage and enforcement of ordinances." Two suggestions were made by Judge Lanning in the last report of the State Board of Health. They were in substance as follows: First. For the larger cities, greater discretionary power should be given to Boards of Health as to the amount of money that may be expended to execute properly the fifteen powers delegated to such Boards. Second. "That the State Board of Health should have the right to apply to the Court of Chancery for an injunction to restrain a nuisance or a business hazardous to the public health, in all cases in which the proper Health Board fails to act, and in all cases where the nuisance or business affects the health of the citizens within the limits of two or more sanitary districts."

Counselor William I. Lewis, of Paterson, in speaking of the health law of 1887, says in the last annual report of the Board: "That while Local Boards were enabled to abate a nuisance existing on property and to recover from the owner the expense incurred, yet that where the owner was a non-resident, in which case the recalcitrancy is most often found, the fact that the recovery of the amount must, according to the form of the statute, be by action of debt, precludes recovery by the Board, but that an amendment to the act, allowing a recovery by attachment, would give ample remedy in such case."

But there are other needs of importance, especially to Local Boards. Freedom from political control and an increase of sanitary knowledge by the members are both needed to accomplish the best results. And, too, it must be said that the relationship that the medical profession bears to Health Boards is not fully appreciated. With the State Board of Health as a model, a corresponding amount of intelligent activity and business methods on the part of Local Boards would materially build up the sanitary defenses of the State, and widely diffuse the knowledge to maintain them.

And now a word in regard to the New Jersey Sanitary Association. Since its organization the Association, by its annual meetings, by the publication of its transactions, and by the commingling of sanitarians from all sections of the State, has added largely in the progress of sanitary science. Its members have aimed to contribute papers in which sanitary matters have been dealt with in a specific way, and which have, therefore, possessed a positive value. May the Association continue in this high aim; may it encourage scientific study, and enlighten public sentiment; may it promote the interests of sanitation by mutual acquaintance and interchange of ideas; may it never cease to disseminate knowledge and to watch over the interests of the State.

When the population of New Jersey thoroughly understand and practice the simple rules of public health; when our architects, builders and plumbers are encouraged to make use of the best sanitary appliances in our homes and in public edifices; when the medical and legal profession exert all their influence in favor of sanitary jurisprudence; when our local authorities and State Government appreciate the importance of public health to the taxpayer and wage-earner; when, in short, we have done all in our power to advance the cause of health, then, and not till then, will our work be done.

It rests with you, gentlemen, as members of this Association, to hasten, by your united efforts, the coming of that day, and may it soon dawn on this fair State of New Jersey.

THE BEGINNING OF SANITARY ADMINISTRATION IN NEW JERSEY.

THE FIRST REPORT.

The beginnings of sanitary inquiry and administration in New Jersey are of interest, both historically and as enabling us therefrom to reckon the rate and method of development which has since taken place.

While the first effort was temporary and tentative, it showed our State as one of the pioneers in the important movement about to take place, and as having some conception of the important interests involved. Twenty-five years have elapsed since the first report was made. As it was brief, and is not accessible, the Board has ordered its reprint in this report.

While the immediate occasion for it was the threatening of a cholera epidemic, a much wider scope of the subject was entertained. While it could not be said that there was any general or legislative sentiment in favor of any permanent organization, the effect of the bill which allowed this report, was to draw public attention to the subject. It thus slowly helped to prepare the way for the fuller report of 1874, and for the establishment of a State Board in 1877.

REPORT OF 1866.

"In accordance with the provisions of the act of the last Legislature of this State, authorizing the appointment of a Sanitary Commission, we now have the honor of submitting our report.

"The general subject commended to us for consideration in said bill is that of the public health. None has to do more intimately with the welfare of the citizen or the prosperity of the State. It is a vital and material interest in the highest definition of those terms—it relates to the personal concerns of every family to an extent which may well bespeak for it the attention of all intelligent legislation.

"The prevention of disease is a grander and nobler thing than its alleviation or cure; and one of the highest functions of government is to secure the health of its constituency. Labor and capital, not less than intelligence and virtue, are dependent upon health—for all the causes that deteriorate the physical strength, or lower the robust life of communities, strike death-blows at political economy and national progress. It is only the assertion of a self-evident truth to say that it is the part of true wisdom to legislate in this behalf, so far as may be necessary to remove recognized sources of disease; to mitigate the power of contagion; to enforce such laws of health as are fully settled; to give information as to existing evils and the methods of abatement, and to secure such statistical information as will instruct as to the origin and prevalence of influences prejudicial to vigorous vitality. Could we arrange all the favorable and unfavorable forces bearing upon a city or State—so far as its prosperity and the happiness of the citizen are concerned—in an account of credit and debts as in a ledger, not only would the sick man always fall on the debtor side, but to this must be added the demand made on the time of others, the unprofitable expenditures of disease, and besides this, all those results of diminished vitality which, while they may not confine to the sick-bed, yet diminish and restrict the capabilities of production and endurance.

"Independent, then, of those philanthropic impulses and benevolent sympathies of human nature which should lead governments, not less than individuals, to alleviate suffering, just because it is suffering even in a more civic aspect, and as a question of legislative policy and material wealth—the public health requires to be dealt with by the governing powers as a great and weighty public interest. With pleasure as citizens, no less than as physicians, that, in the act appointing us there was recognition of the fact, we have turned our attention to the general subject referred to us for brief report, and to the special inquiries suggested in connection therewith.

"As by the act our duties were not meant to be final, but introductory to and suggestive of 'future enlightened action for the promotion of the public health,' we need notice only a few leading facts as illustrated, and allow these to serve as pointers in reference to what is desirable to be done hereafter.

"*I. Cholera.*

"As the Commission was requested to furnish to the Governor at as early a day as practicable, such information and advice as they might deem important in reference to Asiatic cholera, our first attention was directed to this subject. After availing ourselves of the best sources of information, we addressed to Your Excellency a letter embodying such precautionary advice and suggestion as seemed to us most expedient to be given to the public. It was voluntarily published by the entire press of the State, and thus served to direct the popular mind to the most reliable sanitary antidotes to the prevalence and extension of this epidemic. An important suggestion as to hygienic improvement on lines of public travel, was not responded to with desirable promptness, but a second reminder secured the desired result.

"With thanks to a kind Providence and to the Metropolitan Board of Health, we are able to rejoice that cholera did not become a widespread disease in our State. We have, however, reliable reports as to over two hundred fatal cases. Hudson City, Hoboken, Burlington, Bridgeton and Camden suffered most severely, while several other places on lines of public travel numbered from one to fifteen cases. The detailed history of the disease, as manifested in each locality, is of much interest, but too extended for the limits of this report. Its history, its mode of invasion and its fatality, were demonstrative enough to teach us salutary lessons, if we will but heed them. Where it did occur it was as virulent as in the more crowded haunts of the metropolis. In nearly all cases it was directly traceable to some nestling point in New York or Philadelphia, and in many instances the first case in a town would be in the person of a stranger or visitor recently arrived from one of these cities. The portability of the disease is fully established, and yet we are not prepared to say that ever and only thus it is propagated. Its history, however, has shown beyond the possibility of doubt, the power which sanitary law possesses to stay its advance, and by parity of reasoning, it teaches us the control that States and cities may exercise over other epidemic influences. In New York City there were not five cases through all the year which did not occur in overcrowded tenement-houses or were not traceable to some such incubating and propagating point. The same fact was illustrated when it raged with greatest intensity in our own State, and in every case where prompt and well-directed sanitary police was exercised, the disease was promptly limited. We can scarcely insist too much upon the power which effectual laws and prompt sanitary regulations have over its propagation. Where the disease invaded incorporated cities it was generally thus promptly met by the municipal authorities, and as in Elizabeth, Newark, Jersey City, &c., promptly controlled. This was not universally the case, and in some instances much disadvantage resulted, and expense was greatly enhanced by the want of antecedent organization. On this account alone thousands of dollars were expended where hundreds would have sufficed under an established health system, and none felt this more than those who by their promptness and efficiency incurred the outlay. Besides in thus getting ready just when the enemy has invaded and the attack commenced, some lives were sacrificed.

"Where cholera or any epidemic occurs outside the limits of municipal authority, there are still greater embarrassments. It occurred, for instance, to the President of our Commission to be summoned by telegraph to a country village, in which several cases of Asiatic cholera had occurred, and yet in which, for the want of any health officer, there was undoubted neglect of hygienic measures. Disinfectants were not at hand, sanitary requirements could find no officer with the proper authority, and the very couch and furniture of the dead were sold within twenty-four hours at auction. We believe it was only the prompt action of physicians, sustained by your Commission, and the ready aid of a prominent railroad company of the State, in supplying disinfecting material, that checked the spread of the disease. In other country places where isolated cases occurred precisely the same felt want was experienced.

"The reasons we had for expecting cholera the past year are as potent for the coming one. It is not exceptional for the second year to be more fearful than the first. It still lingers about New York City, and is prevailing at foreign ports. Every precaution of the past needs to be used, while now is the time, by law, to correct any mistakes that have occurred. This is more practicable, because measures thus adopted are such as are indicated on grounds of general hygiene, and are no less essential and operative in the diminution of typhoid fever, cholera infantum, and zymotic diseases generally. We believe that, as a settled principle, every city should be required by legislative enactment to have its permanent Board of Health, and every township its health officer, with power sufficient to decide the conditions of nuisance, and promptly to apply the needed cleansing.

"*II. The General Sanitary Condition of the State.*

"As to other items alluded to in the act creating this Commission, we beg leave to note them in the order they are referred to in said act.

"In reference to 'the general sanitary condition of the State,' we need only say that, while we can claim for it some of the best natural advantages, it is not exempt from those prevalent influences which, in all rapidly-growing States, need intelligent attention. As a great thoroughfare State, it calls for all that health-fostering and health-protecting guardianship required on great lines of public travel and mart. As everwhere dotted with towns and cities, rapidly filling with a mixed population, it is unavoidably subjected to those influences modifying natural healthfulness with which all cities, and especially all manufacturieg cities, abound, while its variety of climate, of elevation and of soil, its sea and mountain surroundings, its diversities of geological formation and of hygrometrical exposure, all make it important that these be recognized and investigated in their relations to public health.

"The same intelligent care which seeks to educate the masses, should do all in its power to secure the health of the body while attempting to develop the resources of the mind.

"That appreciation of practical science which sends forth the geologist to define the basic structure of the State, and locate the wealth of its deposits, should not overlook the relations of structure, drainage, &c., to health, and should be on the alert to secure such definite knowledge as will not fail to tell practically on the welfare of the citizen by the limitation and diminution of disease.

"*III. Epidemic and Contagious Diseases.*

"As to 'the prevention and curative treatment of epidemic and contagious diseases,' what has already been said in regard to cholera applies to these. There is but little difference of opinion as to the availability of well-settled hygienic precautions; and physicians of every grade, and sanitary philanthropists in every calling, feel more sensibly each succeeding year how much of disease might be prevented and controlled. This result can only be secured when the governing powers encourage and provide for the diffusion of sanitary knowledge among the people, and enact such laws as will secure conformity to the plain necessities of the public good in this regard.

"In a medical report for 1864, a physician of a village in a northwestern county of our State, whose opinion is most reliable, says: 'By observation it convinces me that typhoid fever, for the last twenty years in this locality, has been chiefly traceable to animal putrefaction, the result of the vicinity of slaughter-houses or obstructed drains.' This is but one of a host of illustrations of what, in other instances and in other diseases, is often recognized by medical men, and yet, practically, there is the greatest difficulty in abating the evil—except in the exercise of power conferred by law. Wise legislative action should make it possible to spread before the people the plain facts of public hygiene, and in city or country promptly to abate any disease-exciting nuisance."

"*IV. Vaccination.*

"The subject of 'vaccination' is another of the points alluded to in the act. From the report of Dr. Cooper, to whom this item was referred and as adopted by the Commission, we make brief abstract. We are deeply impressed with the importance of making some provision whereby the entire population of our State may be enabled to secure for themselves the benefits of this protection.

"The lapse of three-fourths of a century since its discovery has but served to confirm the opinion at first entertained of it, as being one of the greatest boons ever conferred upon the human family. It has been the means of saving millions of human lives, as well as mitigating the suffering from one of the most loathsome diseases to which mankind is liable. Yet, strange as it may seem, the great value of this discovery is still unappreciated by numbers of our citizens. Its very simplicity, as well as safety, seems to have rendered many persons indifferent to its great value. Nor does this neglect prevail only among the indigent or ignorant; for wherever the disease appears in an epidemic form, as it seems to do every few years, it is well known to physicians that many families of children are found entirely unprotected by vaccination.

"The Commission do not hesitate to recommend that some legislative action should be had to make attention to this subject obligatory upon the whole population of the State, as has been done in most of the European countries, as well as in several States of the Union.

"The most feasible way seems to us to make it obligatory that all children entering schools in this State should be vaccinated, and at the same time provide, as is done in most large cities, for the gratuitous vaccination of the indigent. In the rural districts of our State no provision is made, and whole families of children are met with, none of whom have been vaccinated. Were some plan like this adopted throughout the State and faithfully carried out, all would in due time be reached and the general mortality be sensibly diminished. Thus it would not happen, as it did some two years since, that in six counties and three large cities of our State, small-pox was epidemic, while in Boston, by virtue of their perfected system of vaccination, but one case occurred. In fact Massachusetts, Rhode Island and Connecticut boast that no cases now originate in these States. The past year we have been more exempt than usual, and yet one city reports one hundred and sixty-five cases. The public good requires that the people should not be exposed to so loathsome a disease when an effective, cheap and simple remedy is so easily placed within the reach of all.

"*V. The Insane.*

"'The treatment of the insane in county and township poor-houses' is another subject specified, and one by every argument of philanthropy and Christian charity claiming your distinguished consideration. This matter was especially referred to Dr. Ryerson for report, and from said report we beg leave in its language or substance to make brief extracts.

"The Commission, in order to learn the number of the insane in county and township poor-houses and their treatment, issued blanks to the proper local officers, to be filled up and returned to us. But as this was no part of their legally-assigned duties, general returns from the whole State were not secured, and the Commission is consequently without full statistics upon these subjects But from a considerable number received and from other sources of information, the members of the Commission feel authorized to report that the care of the insane and idiotic in the alms-houses of the State while better than it once was, is yet far behind the demands of public sentiment. The admirable arrangements and happy working of the asylum have so educated the citizens of the State, that there is very general and just dissatisfaction with the provision made for the insane in poor-houses, and as deep sympathy for the indigent but not pauper class of these unfortunates, who either have never been to the asylum, or whose time there having expired, have been returned.

"We beg leave to assert that this public dissatisfaction must always exist from the nature of the case. At the township or county houses, if the insane are in close confinement, their place of seclusion is generally some dark, unhealthy cell, or if not, they are placed where they cannot but be subjected to the gaze and torment of others, and to the injury as well as discomfort of all. Even the insane and the idiotic should not thus be mingled. These two classes react injuriously upon each other, and require totally different methods of training and treatment. The idiots are disgusting to the insane, and often excite them to phrenzied outrages, and this excitement tends to render the cases of the insane still more hopeless. In some of the poor-houses the idiots are sometimes employed, or at least allowed, to take care of the young children, or to mingle indiscriminately with them. One member of this Commission is thoroughly convinced, from personal observation, that this intercourse has a most disastrous effect upon their young minds, and impressions are made of lasting injury to them and to society—morally, socially and economically. From the census of 1860, and the partial returns made to your Commission, we believe that the number of insane and idiotic persons in the State, who cannot be accommodated at the asylum when its extension is completed, will be greater than the number in it; and it will then be as large as any one such institution should be.

"But while your Commission is satisfied that the people of New Jersey will be fully prepared to sanction any provision that the Legislature may make, or that Your Excellency may recommend or approve for these unfortunates, it is convinced that further preliminary investigations should be made, because—

"*First.* No appropriate legislation can be had until accurate statistics are obtained as to the numbers of the insane and idiotic separately, with a full statement of age, sex, condition, and an accurate history of the causes of their insanity or idiocy, that thus the kind and amount of provision required may be more apparent. These statistics cannot be gathered without an organized effort and discriminating classification, such as after the experience of the past we might be able to suggest.

"*Secondly.* While recent and chronic cases of insanity are frequently associated in treatment, and in one institution with advantage, the management of the insane or idiotic is so entirely different, we feel that the fullest information is desirable as to the most approved and practical methods by which the demented and feeble-minded may be cared for or improved. It has been suggested to the Commission that it might be practicable to include, under one general supervision within our limits, the class and those who are now supported by New Jersey in the institutions of adjacent States. There can be no doubt as to the need of some provision; and just what it should be all will be more fully able to judge when the proper facts are elicited. Either by a Commission, or, better still, by the provisions of some general sanitary and statistical law, there should be no delay in securing these.

"*Thirdly.* Measures for a different disposal of the idiotic or insane scattered throughout our State, cannot now perhaps be prosecuted without embarrassing the authorized improvements now in progress at the asylum, which when completed will accommodate as many as should assemble in one institution, and will make it so commodious as to provide for nearly all needing such care, if the idiotic are elsewhere sustained. Your Commission has visited the asylum and conferred with the Superintendent, and believes that an entire accordance of view exists on the subject. When the improvements, now rapidly advanctng, shall be fully completed, the asylum will require only such appropriations as may be needed for current expenses. By that time, it can be ascertained precisely what further provision may be needed. Until then we hope it may not be necessary to return any of those at present in the asylum for care or treatment to county or township houses, as the enlargement will for a little time relieve this well-conducted, model institution from a felt embarrassment. In the meantime the State should perfect its plans as to other unfortunates

"*VI. Condition of Poor-Houses.*

"In connection with our attempted investigations as to the insane and idiotic in county and township poor-houses, we instituted some inquiries in reference to these institutions, and it has become quite apparent to us that in parts of our State 'the poor system' is essentially defective; while in some parts the poor are farmed out to the lowest bidder, in others they are congregated together without sufficient regard to the use of those means which prevent pauperism as well as provide for it.

"On the other hand, we are not without models in our own State, which other towns and townships might imitate, and our error is in having no public officer whose duty it is to regard these and other interests of public hygiene and to bring them to the attention of those who are themselves conscious of defects, but for the want of such correspondence and information know not how best to remedy existing evils.

"It is noble to provide for the afflicted and the destitute, and right to punish the criminal, but the philanthropist who sees one generation of paupers providing the next, who beholds insanity too often transmitted or originated as a result of errors in marriage or habits, and who sees vice spring out of the filth and bad air and unfit homes, and then subjected to punishment not reformatory, cannot but inquire if it would not be wiser and more economical legislation, by sanitary regulation and information, to dry up the sources of degradation as well as to make provision therefor. Ounces of such prevention are better than manifold pounds of cure.

"*VII. Vital Statistics.*

"Your Commission would desire to call Executive attention to the matter of vital statistics. Their importance, like that of a census in other affairs, has long been recognized. Their important bearing on questions of human health and vitality, as in the records of births, marriages, deaths, and the causes and character of diseases, has been appreciated as furnishing important indications as to influences operative upon the conditions of life, besides their value for reference as records. Our own State, in common with most others, has long regarded this fact, but these statistics, as at present obtained, at large expense, are of little consequence. The last report of the State Secretary deplores this fact, and we do not know of a single physician or public statist who ever refers to them as evidence, or regards them of any value. This does not arise from the unfaithfulness of the chief officers, but from obsolete forms of classification, incomplete returns, and from their being merely an appendage to weightier official duties. These should be procured and arranged according to uniform and scientific schedules under the superintendence of a medical or expert statist, and this could be done with economy to the State, and so as to render them valuable and instructive in matters relating to the common weal.

"*VIII. Workshops and Laborers.*

"The matter of workshops and in general the exposures of the working classes in their employments, has attracted the attention of your Commission, and from a report by Dr. Coleman we subjoin as follows:

"'If it were necessary at this time, material is at hand to make a detailed report on this as well as the other subjects, but as the Sanitary Commission at this early stage is expected merely to advise the public of its wants, the following brief report is given:

"'Whether in the workshop or the field the time of the laborer is at the disposal of the employer, and men who by their wealth command the labor of the poor, too often take from them in a great degree the means of protecting themselves against the injurious agents that have to be encountered in their occupations. To reach these difficulties that may arise, to secure the employer from the reproach of inhumanity, and to do justice to the workmen, there should be some provision to make the employer protect to a greater degree than now obtains the comfort and health of the employed. So little is this important matter regarded, that in almost every establishment where men are congregated ventilation is neglected, machinery is not properly fenced or guarded to prevent accidents, the proper degree of heat is not attended to, and deleterious materials used in the arts are not carefully managed, when science and attention would make them comparatively harmless.

"'To secure these ends, a careful examination should be made of all manufactories where gases, vapor or effluvia of a noxious character are evolved; of establishments where poisonous chemicals are used in the processes of their art; of rooms where many are crowded to work at some branch of business that requires but little muscular exertion, and, as a consequence, making the need for fresh air less recognized; of schools, the worst of all places for undermining the health of the young, if not most carefully warmed and thoroughly ventilated; of popular churches with large congregations, where each individual must remain for a time exposed to an unusual temperature and vitiated atmosphere, and also of districts of country and localities where malaria is known to prevail.

"'These investigations made by competent persons would show conclusively that a great amount of sickness and death could be prevented if a little intelligent humanity were exercised by proprietors or those having these matters in charge. The necessity for this is so obvious that these brief references are sufficient. It is for a wise legislation to work it to a proper conclusion.'

"There are various other practical subjects that, even in a casual inquiry, have suggested themselves to your Commission as of great sanitary importance in their bearing on the welfare of the citizen and the prosperity of the State, and as worthy of being presented from time to time to the people, in order to preserve them from avoidable causes of depression and disease, and to secure that prevalent, vigorous vitality conducive to prosperity and wealth, and to unimpeded labor—the joyousness of health—the greatest happiness of the masses.

"But the subjects already so briefly alluded to must suffice as specimens of many others having to do with the material interests of all classes.

"Every physician can recount cases of disease and death directly resultant from prevalent morbid influences, which might easily be abated by proper sanitary provision; and the intelligent man, in any calling, who marks the more declarative course of epidemics, becomes no less enthusiastic in support of this department of reformatory law.

"We believe great advantage would accrue to the people of the State from the enactment of a general health code, which would define more accurately the powers of local health authorities, and require them where none exist, to secure the diffusion of proper information, search out and remedy prevalent morbific influences, secure accuracy and uniformity as to statistics, and, in general, conserve the greatest physical and personal, social and moral interests of the public. By such a method all the various suggestions made in this report could be carried out, and such others as a wise legislation might devise. This report is but an abstract or synopsis of views and facts which the Commission are ready to present to Your Excellency, or to the honorable Legislature, when desired.

"We feel that we need not now say more on a subject which speaks for itself in language as importunate as the pleadings of suffering which can be relieved can make it, and in tones as startling and thrilling as the groans of death, which might be averted, can utter it.

"It is our pleasure in this service to know that they will reach the ears of an Executive so keenly sensitive to every call of human suffering that his heart only needs the logic of facts to move it to responsive and effective action, and that through him we address a Legislature which showed a unanimous interest in the objects of this act, and which by its past beneficent provisions has honored us among the sisterhood of States. We only ask that you devise and execute such laws in these regards as shall better protect us all as citizens; as shall make our highways free from the contagions of disease; our workshops places where labor and capital may be aglow with health, and the homes of the people, where the women and the children are, freer from those vitiated influences which now enfeeble, endanger and destroy.

"We have the honor as a State Sanitary Commission thus to respond in accordance with the act and design of our appointment.

"EZRA M. HUNT, Metuchen,
President,
"J. B. COLEMAN, Trenton,
Secretary,
"R. N. COOPER, Camden,
"THOMAS RYERSON, Newark,
"ISAAC A. NICHOLS, Newark,
"*Sanitary Commission.*"

WATER-SUPPLIES.

BY A. CLARK HUNT, M.D.

The bearing of all questions concerning public water-supplies upon the public health is of such importance as to demand careful and constant attention. Their bearing on general domestic and personal cleanliness is such as to render a fair quality and sufficient quantity indispensable. Only, however, when we appreciate the effect the daily consumption of water, as a drink, has upon individual health, do we realize that a good and pure water-supply is an absolute necessity. In addition to the general evil effects of impure water, Drs. Snow, Murchison and others have long since shown it to be the carrier of specific contagion, such as cholera and typhoid fever. More recent knowledge as to bacteria has widened this field so as to include many diseases as capable of conveyance through a polluted water-supply.

The State Board of Health has from the first given much attention to this subject, and the result has been increased attention to the matter and the introduction of pure water into more of our cities.

Nearly all cities now insist that before any source of supply is chosen, all necessary knowledge as to the character and capacity of the water-shed shall be obtained. In most instances the putting in of a supply is under the direction of a competent hydraulic engineer. In some instances in the State, where this has not been done, the result has been very unsatisfactory.

There are many instances where cities, for the purpose of avoiding debt, give over their rights to private water companies, which do not readily respond to complaints. There are also many places where the water-supply is not properly guarded from contamination, where no system of patrol or regular examination is carried out, and where the condition of the reservoir, pipes, &c., is not definitely known. Although there are cases where a city is of necessity compelled to rely upon private companies, yet, as a rule, cities should own, operate and control their water-supplies.

Another difficulty that arises is due to the fact that the State has not properly guarded its own eminent right in the potable waters within its boundaries. While asserting riparian rights in other directions it has too easily relinquished its claims upon the sources of its public water-supply. The State has done this notwithstanding that the State Board of Geological Survey, the State Board of Health, the State Water Commission, represented by L. B. Ward, C.E., an accepted authority in such matters, and others have drawn the attention of our legislative authorities to the facts in evidence.

So important was the communication in this respect, made to the State by Governor Abbett in his message, January, 1892, that we here transcribe it, in order that it may be kept before Boards of Health and the general public:

"STATE WATER-SUPPLY.

"The importance to the State at large of collecting more precise information regarding the sources which shall be permanently available for water-supply, with the view of securing their unrestricted use by the immense urban population of the future, can scarcely be overstated, and I again draw attention to the subject. That New Jersey possesses such sources of unsurpassed value as to quality and location seems to be put beyond doubt by the researches of the State Geological Survey, and that they should be carefully guarded and husbanded to meet future demands is likewise indisputable.

"The remarkable progress of this State during the last fifty years in population, and especially during the last decade, in the number and size of its towns, and in all the factors that favor commercial and industrial development, affords reasonable ground for anticipating an equally great advance in the next half century, both in the actual number and in the density of the resident population. The demand for water will become too great, even in the smaller towns, to admit of a supply from springs or artesian wells, while the inevitable aggregation of urban and suburban communities in certain counties and districts will of itself compel the abandonment there of all dependence upon ground-water, or upon the method of pumping from adjacent streams or rivers.

"Recourse must then be had to lakes, streams and artificial reservoirs situated in high gathering-grounds and at considerable distances from the point of consumption. It is the great effort of modern water-supply engineering, under such circumstances, to appropriate some hilly, wooded region of suitable geological character where there is adequate rainfall, little or no agriculture and a sparse population, and where suitable sites can be found for the construction of storage reservoirs.

"The population of the State, as given by the United States census of 1890, was 1,444,933. The number of persons dependent upon public water-supply in that year was 965,390, composing 71 distinct communities and amounting to 66.8 per cent. of the whole population; the average daily supply furnished them was 78,000,000 gallons of water.

"The total population in 1880 was 1,131,116, of which 529,330, residing in only 26 towns and villages, were furnished with public water-supply, amounting to 53.9 per cent. of the total population.

"The number demanding a public water-supply is increasing in a greater ratio than the population of the State. This is true, not only in our State, but in the neighboring States. The ratio of increase of population during the above decade was 27.7 per cent., while the ratio of increase of those requiring public water-supply was 82.8 per cent.

"Geological and engineering considerations seem clearly to demonstrate that in the belt of country underlaid by the granitic rocks which extend from New England across the Hudson river and into the northern part of this State, there exist the sources from which the urban population of New Jersey can best draw its future water-supply. From this formation on the east side of the Hudson, the city of New York obtains its supply through the Croton aqueduct, from a water-shed of 338 square miles in extent, which, with the aid of a comprehensive system of storage reservoirs, is relied upon to meet the wants of 2,500,000 persons in the future.

"Of this granitic region, hereafter referred to as the New Jersey drainage district, an area equally available for the collection and storage of water, amounting to almost 500 square miles, drains into the Passaic and Raritan rivers through their northern tributaries; in this estimate is included 82 square miles of New York territory drained into this State by the Ramapo and Wanaque rivers.

"This territory, with proper storage reservoirs, could be relied upon to meet the wants of a New Jersey population of over 3,000,000.

"In 1860 the population within the present limits of New York City was 830,369; that of the State of New Jersey was 672,035. In 1890, New York City had a population of 1,515,301, and New Jersey a population of 1,444,933. In 1900, assuming the same ratio of increase in each case to continue, New York City would have 2,765,140, and New Jersey would have 3,106,730 inhabitants. If the future wants of New York City will need the comprehensive system which it is now completing, it is certain that in thirty years New Jersey will need a supply from a system equally extensive.

"Assuming that the percentage of population dependent upon public water-supply will be no more than at present (68.8 per cent.), there would be in 1920, in New Jersey, 2,136,800 persons to be supplied with water. If, therefore, the State is to have enough water, even in the near future, to supply its people, it must preserve and guard the sources of supply at its command.

"The experience of New York City clearly demonstrates the wisdom and foresight of its appropriation of the Croton water-shed, and the large outlays, dating back fifty years, which have been made to utilize it. The failure of a certain and adequate water-supply in that city would paralyze nearly every industry, turn thousands out of employment, produce disease, expose the city to destruction by fire, affect its commercial prosperity and even threaten its existence. The cities of our State would experience the same results from a like failure of a certain and adequate supply of water. Wise legislation should guard against such calamities by providing for a system of public water-supply, which will satisfy present demands and meet the necessary future requirements of our urban population.

"The flow from one hundred and eighty square miles of the New Jersey drainage district is tributary to, or can be turned into the water-shed of the Raritan river, and collected at a point five hundred feet above tide, at a distance of thirty-five miles from tide-water at Trenton, and fifty miles from the Atlantic coast at Long Branch. The water thus impounded should be used for the supply of towns in that part of the State south of the Raritan river.

"The flow from eighty-seven square miles of the water-shed of the Rockaway river, can be collected at a point five hundred feet above tide, at a distance of twenty miles from tide-water at the head of Newark bay, and fifty miles from Trenton. The water from this area can be impounded and used for the supply of the northern, central or southern portions of the State, as may be required.

"In addition to the above, there are (including eighty-two square miles drained by the Ramapo and Wanaque rivers in New York State) two hundred and twenty-seven square miles of territory tributary to the northern branches of the Passaic river, the water from which is capable of being impounded at an elevation of over three hundred feet above tide, at a point distant twenty-two miles from tide-water at the head of Newark bay, and can be utilized for the supply of the population in the country lying between the First (or Orange) mountain and the Hudson river, and stretching from the city of Paterson to the Raritan river.

"I have dealt with this question of water-supply on the basis of a comprehensive system looking to the securing of the purest water from the best geological formation, at an elevation permitting its economical delivery by gravity to all parts of the State. The counties of Warren and Sussex must, however, be excepted, because their elevation naturally excludes them from being supplied by such a system. It is true that there are exceptional places, which can be satisfactorily supplied without using this system, as for instance cities or towns lying upon streams which can furnish a supply of reasonably pure drinking water by pumping. But even in such exceptional places the comprehensive system referred to would furnish potable water of better quality at less cost.

"In connection with this question of water-supply I call attention to the presentation of the matter made in my last message. I still entertain the opinion that the attempt of private corporations to withdraw water from rivers and streams to sell to the public, and obtain a monopoly thereof, under which they claim the right to prevent great cities and communities from using the same for public purposes, is dangerous to the public interests. The unusual and dangerous powers which have been given to these corporations should be limited, and the rights of the great body of citizens, and of the municipalities of the State not having contracts with these corporations, should be protected. The right to regulate the use of water for public purposes can only be safely vested, in my judgment, either in the State or in its municipalities, for the equal benefit of all."

The following table shows the urban population, and, together with the succeeding one, is from the same message:

List of New Jersey cities, towns, boroughs and suburban townships having over 4,000 inhabitants at the dates stated, showing the urban population of the State.

CITIES, TOWNS AND BOROUGHS.	POPULATION AND CENSUS YEARS.					
	1890.	1880.	1870.	1860.	1850.	1840.
Newark	181,830	136,508	105,059	71,941	38,894	17,290
Jersey City	163,003	120,722	82,546	29,226	6,856	....
Paterson	78,347	51,031	33,579	19,586	11,334	7,598
Camden	58,313	41,659	20,045	14,358	9,479	....
Trenton	57,458	29,910	22,874	17,228	6,461	4,021
Hoboken	43,648	30,999	20,297	9,659	....	....
Elizabeth	37,764	28,229	20,832	11,567	5,583	4,184
Bayonne	19,033	9,372	....	....	....	....
Orange	18,844	13,207	9,348	8,877	4,385	....
New Brunswick	18,603	17,166	15,058	11,256	10,020	5,866
Atlantic City	13,055	5,477	....	....	....	....
Passaic	13,028	6,532	....	....	....	....
Bridgeton	11,424	8,722	6,830	....	....	....
Plainfield	11,267	8,125	5,095	....	....	....
Town of Union, Hudson county	10,643	5,849	4,640	....	....	....
Millville	10,002	7,660	6,101	....	....	....
Perth Amboy	9,512	4,808	....	....	....	....
Phillipsburg	8,644	7,181	....	....	....	....
Harrison	8,338	6,898	4,129	....	....	....
Morristown	8,156	5,418	....	....	....	....
Burlington	7,264	6,090	5,817	5,174	4,536	....
Long Branch	7,231	....	....	....	....	....
Rahway	7,105	6,455	6,258	7,130	....	....
Gloucester	6,564	5,347	....	....	....	....
Hackensack	6,004	4,248	5,886	....	....	....
Salem	5,516	5,056	4,555	....	....	....
South Amboy	4,330	....	4,526	....	....	....
Bordentown	4,232	4,258	....	....	....	....
Red Bank	4,145	....	....	....	....	....
Lambertville	4,142	4,183	....	....	....	....
SUBURBAN TOWNSHIPS—						
Englewood, Bergen county	4,785	4,076	....	....	....	....
West Hoboken, Hudson county	10,655	5,441	4,111	....	....	....
Kearny, Hudson county	7,064	....	....	....	....	....
Bloomfield, Essex county	7,708	5,748	....	....	....	....
Montclair, Essex county	8,656	5,147	....	....	....	....
East Orange, Essex county	13,282	8,549	4,819	....	....	....
Urban population	889,585	610,071	391,855	206,002	97,248	38,959
Rural population	555,348	521,045	514,241	466,033	392,007	334,347
Population of State	1,444,933	1,131,116	906,096	672,035	489,555	373,306
Percentage, urban	61.6	53.9	43.2	30.7	19.9	10.4
Percentage, rural	38.4	46.1	56.8	69.3	80.1	89.6

To this table we add the sources of supply.

List of places having a public water-supply in New Jersey, arranged by counties: giving date of introduction of water, population in 1880 and 1890, and present daily average consumption of water.

Names in small capitals indicate public ownership, or control of water works: italics indicate ownership in part public; all others are property of private water companies.

NAME OF PLACE.	POPULATION.		Year of introduction of water.	Average daily consumption—gallons.	SOURCE OF SUPPLY.
	1880.	1890.			
Atlantic County—					
Atlantic City	5,477	13,055	1883	1,781,467	Artesian wells and driven wells on mainland.
Bergen County—					
Boiling Spring *1*	865	1,560	1891	....	Hackensack Water Co.: from Hackensack river at New Milford.
Carlstadt *1*	1,500 x	2,000 x	1891	....	
Englewood *1*	4,076	4,785	1888	....	
Hackensack *1*	4,248	6,004	1874	....	
Midland *1*	1,591	1,829	1882	....	
Palisades *1*	2,302	2,590	1882	....	
Ridgefield *1*	3,952	5,477	1882	....	
Rutherford *1*	2,299	2,298	1891	....	
	20,888	26,538			
Burlington County—					
Beverly	1,759	1,957	1887	350,000 x	Delaware river.
Bordentown	4,258	4,232	1856	200,000 x	Crosswicks creek, near Delaware river.
BURLINGTON	6,090	7,264	1804	400,000	Delaware river.
Moorestown	1,000 x	1,500 x	1888	20,000	Spring 1 mile S. W. of town.
Mount Holly	4,680	5,376	1846	200,000 a	Rancocas creek.
Palmyra *2*	571	1,000 x	1889	....	Well near bank of Delaware river, into which water filters.
Riverton	586	1,000 x	1889	120,000 x	
	18,894	22,829		1,290,000	
Camden County—					
CAMDEN	41,659	58,813	1858	7,660,000	Delaware river at Pavonia.
GLOUCESTER CITY	5,347	6,564	1884	500,000	Newton creek; tide-water from Delaware river.
Haddonfield	1,480	2,502	1886	25,000	Springs in ravine collected in a pond.
Merchantville	439	1,225	1888	46,600	Springs on side hill near Pensauken creek. 13 springs flow into the basin.
	48,925	68,604		8,231,600	
Cape May County—					
CAPE MAY CITY	1,699	2,136	1874	350,000	Large well, 30 feet deep. 1 mile from city, is principal dependence.
Cumberland County—					
BRIDGETON	8,722	11,424	1878	362,000	Mill-pond and a large dug well, 30 feet in diameter.
Millville	7,660	10,002	1878	400,000 x	Maurice river, and well 16 feet in depth.
Vineland	2,519	3,822	1886	125,000	Driven wells, 33 in number.
	18,901	25,248		887,000	

NAME OF PLACE.	POPULATION. 1880.	POPULATION. 1890.	Year of introduction of water.	Average daily consumption—gallons.	SOURCE OF SUPPLY.
Essex County—					
BELLEVILLE *3*	3,004	3,487	1871	....	Newark city water; Passaic river.
Bloomfield	5,748	7,708	1882	1,500,000	East Orange wells; 3 deep and 3 dug wells.
East Orange	8,349	13,282	1882		
Montclair	5,147	8,656	1887	189,480	Well near mountain, 51 feet deep.
NEWARK	136,508	181,830	1800	14,079,798	New supply from Rockaway river, &c.
Nutley	400 x	1,000 x	1889	30,000 x	Spring near mill-pond.
ORANGE	13,207	18,844	1883	1,000,000 c	West Branch of Rahway river.
South Orange	2,178	3,106	1891	70,000 x	Wells in glacial drift.
	174,541	237,913		16,869,278	
Gloucester County—					
Wenonah	166	500 x	1885	25,000 a	Pond supplied by springs.
WOODBURY	2,298	3,911	1886	213,000	Headwaters of Mantua creek.
	2,464	4,411		238,000	
Hudson County—					
BAYONNE CITY *4*	9,372	19,033	1882	....	Passaic river.
Guttenberg *1*	1,206	1,947	1889	....	Hackensack river.
HARRISON *4*	6,898	8,338	1886	....	Passaic river.
Hoboken 1	30,999	43,648	1855	5,527,000	Hackensack river.
JERSEY CITY	120,722	163,003	1852	19,300,000 b	Passaic river.
KEARNY *4* (including Arlington)	777	7,064	1887	....	" "
North Bergen *1*	4,268	5,715	1882	....	Hackensack river.
Weehawken *1*	1,102	1,943	1882	....	" "
West Hoboken *1*	5,441	11,665	1888	....	" "
Town of Union *1*	5,849	11,648	1884	....	" "
Township of Union *1*	1,810	2,127	....	....	" "
	187,944	276,126		24.827,000	
Hunterdon County—					
Flemington	1,751	2,000 x	1884	120,000 x	South branch and copper mine well.
Lambertville	4,183	4,142	1878	500,000 a	Swan creek.
	5,934	6,142		620,000	
Middlesex County—					
NEW BRUNSWICK	17,166	18,603	1868	1,254,844	Weston's pond.
Perth Amboy *7*	4,808	9,512	1882	350,000 a	Eagleswood brook; new supply coming from near Old Bridge.
	21,974	28,115		1,604,844	
Mercer County—					
Princeton	3,209	3,422	1883	65,000	Well in filter-bed near Stony brook.
TRENTON	29,910	57,458	1803	3,569,150	Delaware river.
	33,119	60,880		3,634,150	

NAME OF PLACE.	POPULATION.		Year of introduction of water.	Average daily consumption—gallons.	SOURCE OF SUPPLY.
	1880.	1890.			
Monmouth County—					
ASBURY PARK	1,640	3,500 x	1886	200,000 x	Artesian wells.
FREEHOLD	2,432	2,932	1891	175,000 x	" "
Long Branch 5	3,833	7,231	1877	750,000	Cranbury or Whale Pond creek.
Monmouth Beach 5	548	1,000 x	1880	…………	
Ocean Grove	620	2,754	1884	186,300	Artesian wells.
RED BANK	2,684	4,145	1885	125,000 x	Dug well, 62 feet deep, 20 feet in diameter.
Seabright 5	388	1,000 x	1887	…………	See Long Branch.
	12,145	22,562		1,436,300	
Morris County—					
Dover	2,958	3,500 x	1887	25,000	Springs on high elevation.
MADISON	1,756	3,000 x	1891	100,000 x	Dug well, 30 feet in diameter.
Morristown	5,418	8,156	1799	300,000	Springs from 3 sources.
	10,132	14,656		425,000	
Ocean County—					
Lakewood	700 x	1,100 x	1886	90,000 a	Metedeconk river.
Passaic County—					
Passaic	6,532	13,028	1872	400,000	Vreeland's lake.
Paterson	51,031	78,347	1856	10,000,000	Passaic river.
	57,563	91,375		10,400,000	
Salem County—					
SALEM	5,056	5,516	1882	328,088	Quinton's creek and a well.
Somerset County—					
Bound Brook	934	1,462	1889	40,000	East and West branches of Middle brook.
Raritan 6	2,046	2,556	1882	…………	Raritan river.
Somerville 6	3,105	3,861	1882	400,000 a	
	6,085	7,879		440,000	
Union County—					
Elizabeth	28,289	37,764	1854	2,500,000	Elizabeth river.
Plainfield	8,125	11,267	1891	500,000 x	20 six-inch bored wells.
RAHWAY	6,455	7,105	1872	690,000	Rahway river.
Summit	1,910	3,502	1889	75,000	Well in glacial drift.
	44,719	59,638		3,765,000	
Warren County—					
Belvidere	1,773	1,768	1878	90,000 a	Delaware river.
Blairstown	1,458	1,662	1889	80,000 x	Wells and a stream fed by springs.
HACKETTSTOWN	2,502	2,417	1860	150,000 x	Springs collected from several points.
Phillipsburg	7,181	8,644	1887	300,000 a	Well near Delaware river.
Washington	2,142	2,834	1882	150,000 x	Springs on Scott's mountain.
	15,056	17,325		770,000	

As to most of these sources of supply, for fuller details, see Twelfth Report of State Board of Health, 1888.

REFERENCES.

1. Supplied by Hackensack Water Co. Consumption included under Hoboken.
2. Supplied by Riverton Water Co. Consumption included under Riverton.
3. Supplied by Newark City Water Works. Consumption included under Newark.
4. Supplied by Jersey City Water Works. Consumption included under Jersey City.
5. Supplied by Long Branch Water Co. Consumption included under Long Branch.
6. Supplied by Somerville Water Co. Consumption included under Somerville.
7. City is proceeding to construct water works.
a. Consumption reported in 1888.
b. Consumption reported in 1889.
c. Consumption reported in 1887.
x. Estimated.

Up to this date (January, 1893), we append the following additional list:

BLAIRSTOWN.

Population, 600. Works built in 1889. Owned by Mr. John I. Blair. Source of supply is from wells and a stream fed by springs. The water is pumped to a stand-pipe with capacity of 100,000 gallons. The well is 12 feet in diameter and 28 feet deep. There is one mile of pipe laid. There are 10 hydrants. The ordinary pressure is 65 pounds. Fire pressure is 100 pounds. The capacity is 35,000 gallons per day. Average daily consumption is 1,000 gallons. There are 20 houses using the water. There are no tastes to the water and no contamination. These works were built to supplement an aqueduct used for years by the Blair Academy. The town is rapidly availing itself of the supply. The location of the well and spring is admirable, as it is on a meadow island, so that no surface wash can affect it, and the stream can be made to supplement the supply when the well is low. The stream is fed by springs, and comes from the foot of Blue mountain. An analysis of the water is to be made.

FREEHOLD.

The water works were built in 1890. The works are owned by the city. The supply is from 8 artesian wells located on land bought of Gen. Charles Haight. A receiving cistern with a capacity of 16,450 gallons is connected with the various wells. The water is pumped to a stand-pipe 20 feet in diameter and 100 feet high, having a capacity of 235,008 gallons. There are 52 hydrants. The pressure is from 40 to 50 pounds to the square inch. The consumption is 70,000 gallons per day. The present pumping capacity is at the rate of 48,000 gallons in four hours. Pipes are from ten-inch to three-inch, and there are 8½ miles in all. The analysis of the water is as follows:

Total solids, at 212 degrees Fah., direct evaporation, grains per gallon *		7.161
Silica	0.580	
Sesquioxide of Iron and Alumina	0.107	
Lime	2.524	
Magnesia	None.	
Potash	0.187	
Soda	0.327	
Sulphuric Acid, in Sulphates	0.671	
Chlorine, in Chlorides	0.233	
Solids determined	4.629	
Volatile Matter (Carbonic Acid in Bicarbonates)	2.532	
		7.161
Temporary hardness, equivalent to Calcium Carbonate	2.682	
Permanent hardness, equivalent to Calcium Sulphate	2.775	

Color, good.
Taste, none.
Smell, none.
Reaction, neutral.
General appearance, bright and attractive.

MADISON.

Introduced in 1891. The supply is owned by the borough, at an expense of $60,000. The source of supply is a well 30 feet in diameter and 31.6 feet deep. The well goes through 4 feet of clay and quicksand and 17 feet of stone and gravel. The dip of the strata ran to hardpan. The well is covered, curbed and ventilated, the curb being two and one-half feet above the ground level. The water is pumped to a stand-pipe 25 feet in diameter and 75 feet high, with a capacity of 235,000 gallons. The capacity of the well is 450,000 gallons per day. The pressure is 106 pounds at the station, and 85 pounds at the liberty-pole. Pipes are from ten to four-inch. There are 60 hydrants. All connections are supervised by the Council. Analysis of the water is very satisfactory.

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* Gallon, 58.318 grains.

NUTLEY, OR FRANKLIN, ESSEX COUNTY.

Supply was introduced in March, 1889. It is owned by the Nutley Water Company. The source of supply is a spring. The water is pumped directly into the pipes by means of a turbine wheel. The pressure is 16 pounds. The capacity is 250,000 gallons per day. Consumption is not estimated. Eighty-five houses are supplied. The analysis of the water is as follows:

NUTLEY WATER.

One United States Gallon of 231 Cubic Inches.

Appearance in two-foot tube		Clear, colorless.	
Odor		None.	
Taste		None.	
Chlorine in Chlorides		1.0206	grains.
Equiv. to Sodium Chloride		1.6828	"
Phosphates		None.	
Nitrites		None.	
Nitrogen in Nitrites		0.2403	grains.
Free Ammonia		0.0017	"
Albuminoid Ammonia		0.0017	"
Hardness equiv. to Carbonate of Lime	Before boiling	4.5866	"
	After boiling	3.9145	"
Lime		1.6076	"
Magnesia		0.5233	"
Soda		1.2692	"
Potassa		Traces.	
Oxide of Iron and Aluminia		0.0933	grains.
Silica		0.8631	"
Sulphuric Acid		0.6452	"
Equiv. to Sulphate of Lime		1.0968	"
Organic and Volatile Matter		0.1729	"
Mineral Matter		8.0882	"
Total Solids at 240		8.2611	"
Chloride of Sodium		1.6828	"
Sulphate of Soda		1.1452	"
Sulphate of Potassa		Traces.	
Bicarbonate of Lime		4.6509	grains.
Bicarbonate of Magnesia		1.9097	"
Oxide of Iron and Alumina		0.0933	"
Silica		0.8631	"
Organic and Volatile Matter		0.1729	"
Total		10.5179	grains.

INVENTORY OF PIPE LINE:

Four-Inch.	Six-Inch.	Eight-Inch.	Total.
17,751.8″.	9,418.	272.	27,451.8″.

PLAINFIELD.

Population, 16,000. Supply was introduced in 1891. The engineer is C. B. Brush. Owned by the Plainfield Water Company. Supply is obtained from 20 six-inch bored wells. Water is pumped to a stand-pipe. Water is delivered on top and drawn from bottom. Wells are 45 feet deep. There are 28 miles of pipe running from twenty-inch to six-inch. There are 281 hydrants. The pressure is 44 pounds. The capacity is 5,000,000 gallons. Average consumption is 300,000 gallons. There are 500 houses supplied. Mains are of cast iron. The supply is pure, analysis having been made. The temperature of the water is 55°.

PENNINGTON.

Water has been introduced from Hillside springs.

RIVERTON AND PALMYRA.

These two localities combined have a population of 3,000. The water works were built in 1889. Some extensions have been made since and a duplicate boiler and pump have been added. The works are owned by the Riverton and Palmyra Water Company. The source of supply is an infiltrating well near the edge of the Delaware river. The water is pumped to a stand-pipe. The well is 18 feet in diameter and 16 feet deep. There have been laid 34,437 feet four-inch pipe, 9,535 feet six-inch pipe, and 11,793 feet eight-inch pipe. There are 325 taps and 72 hydrants. The pressure is from 30 to 50 pounds. The capacity of the well is 12,000 gallons per hour; the consumption is 70,000 gallons; but in summer, when lawns are sprinkled, it runs up to 200,000 gallons. Three hundred and eighty-two houses, stores, &c., obtain water from the company. Westfield, a village two miles in the country, also makes use of the supply. Wrought-iron and cement pipes are used. Service-pipes are of galvanized iron and lead. No taste or vegetable growth has occurred. No regular analysis has been made. No record of temperature has been kept.

SUMMIT, MILLBURN, WYOMING, MAPLEWOOD AND SOUTH ORANGE.

The population of the territory reaches, according to estimate for 1892, about 13,000. The water was introduced in Summit, 1889–90, and extended to South Orange, 1890–91. Designed and constructed by Carrol P. Bassett, C.E. The company is called the Commonwealth Water Company. The source of supply is from large wells in glacial drift gravel deposits. The water which goes to Summit is pumped to a stand-pipe. It is pumped direct to South Orange. The company owns 18 miles of pipe, and in South Orange it owns a distributing system of about 11 miles. There are maps of both systems. There are ten-inch mains to Summit and South Orange, and the laterals are 8 inches, 6 inches and 4 inches. There are 65 hydrants in Summit. The stand-pipe water-level is 530 feet above tide. All water is metered. Daily consumption is 250,000 gallons. There are over 600 connections. Mains are of cast iron. The supply is absolutely protected from contamination. Analysis is satisfactory.

WOODSTOWN.

At this writing the new water works plant is just about finished, and the contractors will turn over the works to the authorities in a few days. The water, which is said to be of an exceptionally fine quality, is obtained from artesian wells. The plant cost about $30,000.

An analysis of this water was made under oversight of this Board, and was very satisfactory.

RECENT IMPROVEMENTS AND SUGGESTIONS.

As to the whole subject of water-supply, we only notice such special points as have attracted recent attention.

In a report on the progress of hygiene for 1891, in the Army and Medical Department Report, Dr. Notter, of the Army School, Netley, in a review of "Examinations and Experimental Investigations by the State Board of Health of Massachusetts on the Water-Supply and Inland Waters of Massachusetts, on the Purification of Sewage, and on the Intermittent Filtration of Water," draws attention to the following facts:

"A single determination in a chemical analysis of a water cannot tell what the real condition of a water is, and further, that one complete analysis tells us only what was the condition of the water when the sample was taken. * * *

"That the only precaution necessary to prevent the growth of organisms is, in the case of pure ground supplies, to avoid the action of light. If water is not exposed to light, the growth of algæ would be prevented, and it is thus impossible for animal life to thrive, for they are dependent on algæ for their food. In dealing, however, with surface-waters, two objects must be accomplished; first, the water must be freed from the organisms it contains, and, secondly, it must be protected so that further growth is impossible. For the first, effective filtration is necessary, and he has found that this can be accomplished by passing the water through a layer of fine sand six inches in thickness; if there is any subsequent growth, it is probably due to the water having been passed through the filter too rapidly, the action being more or less incomplete. Once having freed the surface-water from its organisms, its subsequent treatment is essentially the same as that for a ground-water.

"The general plan, then, for dealing with surface-waters is to submit them to slow filtration and then to protect them from the further growth of organisms by excluding light. The importance of these observations will commend themselves to medical officers serving in such places as Gibraltar, where surface-waters are the only available sources of supply.

"The second volume is devoted to the consideration of the sewage question by Hiram F. Mills, M.A., C.E. This part of the report contains a large number of tables showing the composition and characters of the effluent after submitting sewage to precipitating agents and various other methods of treatment.

"No summary, however, is given of the results obtained. Experiments were made at the Lawrence Experimental Station upon the chemical precipitation of sewage, to determine the efficiency of different chemical precipitants. The conclusions arrived at were that where lime is used the amount must depend upon the composition of the sewage in order to obtain the best results. The quantity of lime which was found most effective was that that exactly sufficed to form normal carbonates with all the carbonic acid of the sewage.

"In precipitation by ferric sulphate and crude alum the addition of lime was found unnecessary, as ordinary sewage contains enough alkali to decompose these salts. With ferrous sulphate this is not the case, as ordinary house sewage is not sufficiently alkaline, and lime must be added to obtain good results. Ferric sulphate gave the best results in these experiments, but ferrous sulphate and lime were nearly as good. No precipitant, however, gave results which made the effluent equal in organic purity with those obtained by intermittent filtration through sand."

Another matter that has attracted much attention is the purification of river-water by agitation and the use of metallic iron. Dr. Horace Swete, Public Analyst for Worcestershire, in a recent article gives the following statement as to the application of this method to the supply of Worcester, together with an outline of the process:

"Worcester was so placed that it could not afford to bring pure water from a distance. It was dependent on the Severn, near at hand, the water of which was polluted.

"The experiment had been tried since June 7th of this year of purifying this water by Anderson's revolving purifiers, in which cascades of metallic iron are brought into intimate contact with the water. It was claimed for this process that it removed all color and clay from the water; removed all free or saline ammonia; lessened the nitrogenous organic matter, which would be estimated as albuminoid ammonia, from 50 per cent. to 75 per cent.; removed carbonaceous matter 75 per cent.; reduced the nitrates and nitrites to a trace; and reduced the colonies of microbes in the cubic centimeter to 100.

"Thus with the simple filtration through sand, which held good for Worcester before the Antwerp process was tried, the free ammonia was reduced by 45 per cent.; with the Antwerp process it disappeared. The albuminoid ammonia in the former period was reduced 30, in the latter 70 per cent.; the oxygen required to oxidize organic matter was reduced 30 per cent. in the former period, 66 per cent. in the latter period. The results of the Antwerp process were not quite so good when the Severn was in flood, but were still much better than with simple sand filtration.

"The rationale of the process is summed up as follows: It is chemical so far as the formation of the oxides of iron is concerned and the reduction of some of the carbonaceous organic matter. It is after that mechanical; reducing the pores of the filter and enabling them to undertake what they could not perform before, especially with peaty and clayey waters.

"When a supply of deep well-water cannot be obtained, the result of the experiment at Worcester shows that there is a process that may render a river or brook-water sufficiently good to come within the category of potable waters."

We would also call attention to the great value of filtration and artificial aëration in cases where for any reason a water-supply that is regarded as good becomes turbid or impure.

The form in which such analyses are usually made is as follows:

DEAR SIR—The samples of water received by me for examination by yielded the following results:

PER 100,000 PARTS.

SAMPLE.	Free Ammonia.	Albuminoid Ammonia.	Oxygen Consumed.	Nitrogen in Nitrates and Nitrites.	Chlorine.	Hardness	Total Solids.

REMARKS.—Include *color, odor, sedimentary deposits, microscopic examination of insoluble matter, &c.*, together with opinion, based on result of analysis.

MICROSCOPIC AND BACTERIOLOGICAL EXAMINATION.

It is now customary with chemists to refer specimens to microscopists to determine what kinds of plants feed upon certain forms of sewage, and thus ascertain sources of contamination. Biological examinations are now also made, but as yet determine little unless pathogenic forms are found. In the army laboratory at Netley, the *Army Medical Report* states that "culture experiments have been continued with a hope that by accumulating facts we may possibly be able to arrive at some practical conclusion." This shows how indefinite all present determinations of bacteria are. The mere number of the water-bacteria, has after all, according to Pettenkofer, no hygienic importance. In a review of an article, in a foreign journal, on the self-purification of water, *The Sanitary Record* contains the following statement: "Pettenkofer states that in his opinion the self-purification is due not so much to the direct taking up of organic materials by the algæ as to the decomposition of these materials by means of the increasing amount of oxygen, liberated by the algæ." Notwithstanding the uncertainty as to the exact action of bacteria, it is well for all laboratories, that are fully equipped, to be making and recording such experiments.

In order that one who is not an expert may judge as to the quality of water by comparison, we quote from an eminent author a table of forty-eight drinking-waters, according to purity, giving the means of the analyses in parts per 100,000:

Table of Drinking-Waters according to Purity.

CLASS OF WATERS.	Chlorine.	Oxygen required for Organic Matter.	AMMONIA.		Nitric Acid.	HARDNESS.	
			Free.	Albuminoid.		Total.	Fixed.
"Fit for use"	4.7591	0.0543	0.0045	0.0050	1.2832	17.8409	6.2955
"Usable, but requires filtration"	11.7455	0.0582	0.0066	0.0106	2.2679	13.0909	5.7727
"Unfit on account of organic impurity and of excessive hardness and chlorides"	21.7467	0.2275	0.0266	0.0257	2.2511	31.8667	21.0000

In the first group, "Fit for use," the chlorine and hardness are high, the cause being the large amount of salts present.

In the second group, "Usable, but requiring filtration," the chlorine is in excess. This is due to the proximity of the wells and tanks, at the stations from which the samples were taken, to the sea.

HOW TO COLLECT WATER FOR CHEMICAL EXAMINATION.

Although the method of taking samples is given in the circular of this Board, No. 53, on Drinking-Water, we here add the directions given by one of our chemists, as entering into more detail:

"Waters for ordinary drinking purposes should, if possible, be analyzed within forty-eight hours after being drawn, at the most, and it is always desirable to avoid any unnecessary delay, since certain of their impurities may undergo considerable change. They should be kept in a cool place, if long in transit, and must be sent in *absolutely clean*, and far better, new, *glass* vessels, carefully rinsed out with hot water and afterwards with the water to be tested. The vessel should be filled not quite full and tightly closed with a *new* cork, previously well washed with the same water. It is better not to seal the cork itself with wax, but to seal a piece of cloth over the cork, when this may be deemed necessary. Old corks are very apt to impart an odor or some impurity to the water.

"*One-half gallon will generally suffice;* but it is better to send one gallon."

In conclusion, we would urge the necessity of protecting all public water-supplies from pollution. As this can only be done by the closest inspection and oversight, each Local Board of Health should feel its responsibility and be fully cognizant of its powers. As far as the State is concerned, it should in every way assert and maintain its inherent right in, and control over, the potable waters within its territory.

DISINFECTANTS AND DEODORANTS.

BY EZRA M. HUNT, M.D.

These are perilous words, because so often the use of a disinfectant or deodorant is considered to be equivalent to a thorough cleansing.

A Health Inspector is sent for. He burns the stated amount of sulphur, orders the room opened again after a few hours, and gives out word that the building has been thoroughly disinfected. There is no greater peril to a systematic prevention of disease. Disinfection with chemicals is only elementary and preliminary. Next to it must come thorough flushing with air, light and sunshine. Next to this, the whitewashing of walls or the damp-wiping of hard or painted walls with hot water or some disinfecting solution. If it is a papered wall there must either be dry-rubbing of the wall or, better still, the removal of the paper. Then comes the washing of painted woodwork and windows, the wiping of furniture, and the thorough scrubbing of the floors. Where furniture has to be removed from rooms, it is better to take it out through windows than carry it through the house. All clothing that has been soiled will of course be cleansed or put asoak before removal from the room, while such as can only be cleansed by airing and exposure will be passed out of doors through windows. A similar cleansing of all closets of the room with their contents is included.

All this means that disinfection is only a preliminary act in cases of disease, and that the real secret of success is that most thorough after-cleansing which is included in the idea of housekeeping.

In cases of communicable disease all this falls under the oversight of the Inspector, and he should not pronounce the house thoroughly disinfected until he has personal knowledge that all this is done. There is no greater present farce in sanitation than what many Health Inspectors now report as *thorough disinfection.* It is what Sir John Simon calls "dab sanitation."

WHAT IS A DISINFECTANT?

We regard as a disinfectant any substance which is used and is effective for *preventing infection*. We would speak of three kinds of disinfectants:

First, those which destroy micro-organisms.

Second, those which destroy spores of micro-organisms also.

Third, those which neutralize the materials on which infection thrives, and without which it usually perishes.

We therefore would not degrade and dismiss some substances used by calling them deodorants in contrast, or discourage their use because they do not kill micro-organisms directly in plate-culture experiments. This, however, is not the usual method of definition.

The usual definition of a disinfectant, as accepted from the biologists, now is, that it is an agent which destroys organisms and their spores. This is the only standard test which is now accepted by most biologists, and hence they discard various chemical disinfectants advocated by many other good authorities.

Under this definition we may as well be frank and confess that there is very little actual disinfection done. It is done in such a plant as that of Berlin, or of Paris, as hereafter described. It is done by some disinfecting stoves. It is done when steam-heat is so introduced into the center of bales of rags, as to bring self-registering thermometers up to the requisite height, or when, for instance, the two million microbes, which a consumptive is said to expectorate per day, are each and all touched by some such withering blight. It is done when corrosive sublimate touches each minute microphyte and poisons it by actual contact.

We would encourage every such attempt; we would claim it to be possible and feasible that this should be done or attempted to be done, at quarantine stations, at hospitals, at city disinfecting chambers and wherever skilled men and ready money can be had to fulfill the splendid ideal.

But we should be sorry to say there is no disinfection or prevention of infection where this is not really done. We vindicate the use of disinfectants that only partially accomplish this. We vindicate the use of that class of disinfectants known as deodorants when it can only be shown that they absorb or neutralize the offensive gases of decay, that they arrest putrefaction or dispose of its results, that they inhibit the activity of infective particles or deprive them of their nutrition, and that they very actively promote cleanliness.

Practically, we believe that many of these things properly used with their ability well tested and defined, both chemically and by experience, are doing as much to clean up the world and to co-operate with the cleansing forces of nature and good house care, as can be done by what are known as specific disinfectants, and so that they directly prevent infection. So long as such diseases as yellow fever, scarlet fever, small-pox and numerous others, have no known microbes which we can attack, so long as many others are in dispute, so long as we cannot be sure whether each disinfectant in prescribed strength touches each microphyte, so long as there are changing forms which seem to depend for change and virulence mostly on gaseous and other surroundings, so long as it is undecided as to many known micro-organisms whether or not they have spores, we had better not cast out, as of low disinfecting value, various substances which freshen and purify air, which remove offensive odors, which delay or prevent decomposition, or which, in some way, suspend or prevent the activity of infective particles.

We would accept all proven facts as to which substances will kill a microphyte of anthrax, or of typhoid fever, &c., or as to such as will or will not kill spores, although remembering that what will kill one form of micro-organism will not always kill another, and that what takes place in the culture fluid, or to the microphyte medicated in the laboratory, does not always take place in the hiding-places of the sick-room, or to the multitudes of similar organisms hidden about in divers places. While not too skeptical as to the taking off of these suspects, it is our joy that in the attempt at destruction the immigrant gets a bath, has his clothing ridden of all soiled material, is well aired as well as fumigated, and thus can be inscribed as clean.

Because of these views, we still retain in our circulars a few chemicals, and advise their use without defining their germicide power. As an instance, on the same day I take up a recent address by an eminent American biologist who expresses his surprise that some circular still retain sulphate of iron in its list of disinfectants, and find that several Boards have made this and other alterations at his suggestion. Yet two eminent chemists tell me still to retain it. An editorial of the same week in the London *Lancet*, giving good authority, says thus: "The dejecta should be mixed with or passed into a solution of the sulphate of iron, which is probably the very best disinfectant for the purpose." In the same article it quotes so good an authority as Dr. Cartwright Wood, and says that if sulphate of iron is used the toxines formed can do little harm. There is a chemical as well as a biological side to this subject especially worthy of note, since it is probable that prevention has far more to do with neutralizing products than with killing germs.

Surgeon J. Lane Notter, M.A., M.D., the successor to Parkes and De Chaumont as Professor of Military Hygiene at the Army Medical School, Netley, England, says: "Aërial disinfectants, while not fulfilling all the conditions required by bacteriologists, may act as destructive agents on some organisms which are much more easily subjugated than those which possess the greatest resisting powers to any disinfectant, such as anthrax spores. Practically, we find that they have been of some benefit, and while not placing too great reliance on them in the present state of our knowledge, it would not be altogether wise to discontinue their use."

We therefore believe ourselves, in common with some other Boards, compelled to continue the directions contained in Circulars 64, 44, 45 and Annex as slightly modified in recent issues.

We do not believe in the substitution of carbolic acid for all other disinfectants, because of its uncertain composition, its stenchiness, its high price, its covering of odors. We regret the change in the New York circular, which quite generally substitutes it for corrosive sublimate, the objections to which we regard as fully overcome by the formula of Dr. Parsons and Thorne Thorne, Chief Medical Officer of the Local Government Board of England. The formula is hereafter given.

Wynter Blyth summarizes the estimate he formed of it, as the result of his own experiments and those of others, as follows: "A 1 per cent. solution is strong enough to destroy the more feeble infections, but to be certain that the more resistant forms of germ life are annihilated, it will be necessary to use at least 5 per cent. solutions in water, and the action must be prolonged; if specific excreta are treated, it is doubtful whether 5 per cent. solutions are of sufficient strength, because associated with the hurtful material there is a quantity of organic matter which must on the one hand remove some of the phenol from the sphere of action, and on the other impede the contact of the phenol with the substance which we wish to disinfect." Dr. G. Reid, in his recent work on Practical Sanitation, adds: "In talking of the efficiency of a disinfectant of a certain strength, it is necessary to bear in mind that it must come in contact with the germs to be destroyed without undergoing further dilution, and remain in contact with them a considerable time, not less than twenty-four hours." If carbolic acid is used it should very frequently be tested, as it is a mixture of cresols of various kinds and of varying proportions. The price of the best and most uniform in the English market, namely, the dark-brown acid made by Messrs. Calvert, has often varied in price from 25 cents to 65 cents a gallon.

As in former reports and circulars, we place high estimate upon recently-slaked lime and its use as whitewash where it cannot be claimed to kill every microphyte it touches. During typhoid fever, cholera, &c., in the form of milk of lime it may well be sprinkled in privy vaults and along their sides. Boiling water is of the greatest use wherever it can be employed, and clothing well scalded is not likely to do harm, even though it is claimed that boiling for half an hour is needed by some spores.

The most condensed statement of advanced views as to most disinfectants, that we have seen, is that given by Dr. Notter, of the Army Medical School of Netley, England, in its last report. While it does not discuss fully the various disinfectants, it gives the higher views, the limitations upon their use as germicides and yet indicates the value of some that cannot be proven in practice always to be destructive of micro-organisms.

"DISINFECTION.

"The subject of disinfection has of late years attracted a good deal of attention. This has arisen from our more intimate knowledge of the contagia that improved methods of bacteriology have brought about, and also from the results of Koch's experiments, which are really the groundwork on which the principle of modern disinfection is based.

"Koch's paper on disinfection is to be found in the volume of the New Sydenham Society, 1886, 'Microparasites in Disease,' and a careful study of it will amply repay any labor this entails. Although some of Koch's conclusions do not quite agree with those of Gartner and Plagge, in the main they are fairly in accord with these observers.

"It is well to have some definite meaning for the word disinfectant, which is often used to include antiseptics and deodorants. A disinfectant is an agent which not only prevents the decompositions which are causally connected with the presence of organisms, but also destroys the organisms themselves and their spores. It is really a destructive agent, and the use of this term should be limited to agents capable of producing this effect.

"All experimenters agree that the best test for a disinfectant is its power to destroy living micro-organisms and their spores. This is the only standard test now accepted.

"It would be foreign to my purpose to enter here into all the processes or various chemical disinfectants advocated by various writers. My object is to refer to those best adapted for military purposes, and which are within reach of military surgeons.

"Dry heat is effectual if the temperature is raised sufficiently high (284° Fahr.), and the process is sufficiently prolonged to insure total destruction of the contagia. The objections to dry heat as a disinfectant are (1) that fabrics are injured if they are submitted to any temperature above 230° Fahr.; (2) that it is next to impossible to guarantee a uniform heat throughout the chamber; (3) that dry heat does not penetrate bulky substances easily; (4) the length of time (3 hours at least) required for thorough disinfection.

"These objections render dry heat inapplicable under most circumstances.

"The general consensus of opinion is that steam heat is far superior to dry heat; spores of bacteria are killed much more readily and fabrics are not deteriorated to the same extent. Koch states that in every respect exposure to a current of steam at temperatures above 212° Fahr. is a far more satisfactory method than dry heat. It is more certain, more simple, more rapid, more economical, both in original cost and expense of working, and involves less injury to the articles to be disinfected. It is important, however, that the steam should be saturated, and not a mixture of air and steam; and it is essential that there should be a current of steam, by which the air already existing in the articles to be disinfected may be displaced. In high-pressure apparatus, therefore, the steam is allowed to 'blow off' once or oftener during the process.

"Carbolic acid and its compounds have been much employed for disinfecting purposes. The chief points to note are (1) that the solutions must be sufficiently strong in order to obtain good results, and (2) that these take a considerable time to act.

"According to Koch, a 2 per cent. solution failed to destroy anthrax spores within a week; 3 per cent. took seven days, 4 per cent. three days, and even 8 per cent. required more than one week. On the other hand, Gartner and Plagge found that a 3 per cent. solution killed micro-organisms within a very short time.

"Any strength under 5 per cent. is unreliable and will not be effective within 24 hours.

"Carbolic acid is well adapted for the disinfection of tubercular sputa, an equal quantity of a 5 per cent. solution destroying the micro-organism within 24 hours. Schill and Fischer state, as the result of their experiments on fresh tubercular sputum, that it is the most satisfactory disinfectant.

"It may be noted that a 5 per cent. solution in oil or alcohol has no action on anthrax spores. Koch significantly adds: 'When it is sought to disinfect dry objects, such as instruments, silk, catgut, &c., by means of carbolic oil, there is absolutely no effect even upon the least resistant micro-organism, beyond that due to the oil itself.'

"All observers agree that mercuric chloride is the most active bacterial poison; a solution of 1 in 1,000 destroyed anthrax spores within a few minutes. It is the only known disinfectant which, without any previous moistening or other preparation of the articles to be disinfected, destroys the most resistant organisms in a few minutes by a single application of a highly dilute solution (Koch). In the case of albuminous fluids, however, the sublimate may be precipitated, and thus enough of the salts of mercury will not be present in the solution to effect complete disinfection; for example, the addition of sublimate solution to tubercular sputum has been found to be quite insufficient for disinfection. To obviate this disadvantage, Dr. Parsons has recommended the addition of an acid to the solution. He gives the following formula as applicable for general purposes: Mercuric chloride, ½ ounce; hydrochloric acid, 1 ounce; aniline blue, 5 grains; water, 3 gallons.

"It is well to remember that mercuric chloride will corrode iron and other ordinary vessels, and is decomposed by contact with them; therefore it must be used in non-metallic vessels.

"The sole drawback to mercuric chloride as a disinfectant is its poisonous properties, but in military hospitals there should be no difficulty in guarding against accidents from its use. If aniline blue is not available the solution may be colored with permanganate of potash.

"For the disinfection of clothing, bedding, &c., used by the sick, those articles which can be washed should be disinfected before washing. This is necessary to destroy the poison at once, as also to prevent permanent stains being left on the clothing by the coagulation of albuminous matters The grosser dirt may be removed by soaking the articles in a solution of corrosive sublimate, which will not stain or rot the clothing. The articles may be subsequently boiled, if disinfection by steam heat is not available.

"In all cases where it is desirable to use gaseous disinfectants chlorine is the best at our command, and is superior to sulphurous acid. It acts best when the air is saturated with moisture: this may be effected by wetting the walls, floor, &c., and by steam spray. As the gas is heavy, each vessel containing the chemicals for generating the gas should be placed in the upper part of the room, when the gas will readily find its way to the lower parts. Chlorine gas destroys all organisms, even the most resistant, that lie upon the surface, but it has only slight power of penetration into crevices and fabrics (Koch).

"The results of Koch and Wolffhügel's experiments with sulphurous acid have not been favorable to this agent as a disinfectant; it penetrates with difficulty into crevices in walls and into the deeper masses of clothing, and requires the presence of moisture to have any effect. Dujardin has recently advocated the use of sulphurous acid, but 'the experimental proofs brought forward by him are quite insufficient' (Flügge).

"Dr. Sanarelli has very recently (*Giornali della Società Italiana d Igiene*, Nos. 11 and 12, 1891,) given the results of a series of experiments he made, and these appear to confirm those of Koch's. He is of opinion that little reliance can be placed on sulphurous acid or even on chlorine as disinfecting agents, and concludes an able article on this subject by stating that it is to be deplored that a reliance upon their illusory efficacy should have retained them in use now as agents of thorough disinfection.

"Among much that is doubtful as regards the efficacy of aërial disinfectants one fact is clearly brought out, that any attempt to disinfect by chemical means the air of sick-rooms is useless, as, if they are present in sufficient quantity, they render the air of the room irrespirable. Nor should the fact that the contagia of different diseases possess different properties be overlooked. The poison of typhus becomes inert when diluted with air, and does not spread to any distance, while recent evidence goes to prove that small-pox is capable of transmission and does not lose its virulence by free dilution with air, but, retaining its power, can infect those living in the neighborhood.

"Aërial disinfectants, while not fulfilling all the conditions required by bacteriologists, may act as destructive agents on some organisms which are much more easily subjugated than those which possess the greatest resisting powers to any disinfectant, such as anthrax spores. Practically we find that they have been of some benefit, and while not placing too great reliance on them in the present state of our knowledge, it would not be altogether wise to discontinue their use."

We are aware of the criticism on corrosive sublimate as to its coagulation of albumen and the separation of the mercury. This objection is very limited when dealing with thin liquids and is easily overcome by adopting the formula recommended by Dr. Thorne Thorne, President of the Local Government Board, and indorsed by the Royal College of Physicians of England. It is as follows: "Dissolve half an ounce of corrosive sublimate and five grains of commercial aniline blue in three gallons of water and add thereto one fluid ounce of hydrochloric acid. Preserve in earthenware jars or wooden tubs." Glass jars might also be used.

The coloring with aniline blue, indigo, bluing or permanganate of potash protects from accident, Although so long in use, no accident from this corrosive sublimate solution by mistaking it for water has yet been reported. The Saint Bede disinfectant is sold in the form of blocks, which contain anhydrous sulphate of soda with some free sulphuric acid and 17.5 gains of corrosive sublimate. The block is colored blue with indigo and scented with eucalyptus, making with water a blue solution.

DISINFECTING PLANTS FOR CITIES.

We draw attention to the statement of Dr. Abbott as to disinfecting stations, which is as follows: "There is no question of a public sanitary nature in which the large cities of the United States are so far behind as in the adoption of public disinfection stations for the disinfection of all portable articles which require disinfection; that is to say, public buildings or plants not necessarily expensive, but fully equipped with all the appliances for disinfecting such household articles as may be brought to them for the purpose, such as bedding, mattresses, clothing, blankets, carpets and upholstery. The stations of this character which the writer visited last year in Berlin and Paris are models in every particular. The principal point in these stations worthy of mention is the absolute separation of all infected from disinfected material by means of an impervious wall running through the building. In this wall the steam apparatus is placed."

All of our larger cities should have some such plant. We are glad to be able to give from the Paris correspondent of the London *Lancet* a full description of these stations. It is of great value not only to those cities that can furnish a similar plant, but to all who would study exact disinfecting methods, since it gives various details suggestive as to methods where there are not so full structural provisions. The following is the description :

"The principal disinfecting station is in the Rue des Recollets, near the Eastern Railway station, and its organization is more perfect than anything of the sort I have seen in England. Of course the premises are divided in half with two separate entrances—the infected and the disinfected sides. The disinfectors arrive in the morning on the clean side. They are then introduced into a little room, where they take off all their clothes. From this there is a middle room with the necessary apparatus for washing and for taking a douche. In a third room they find their working clothes, and from this third room they reach the infected side of the establishment. To return to the clean side, they must leave their working clothes in the third room, take a douche in the middle room and put on their ordinary clothes in the first room The disinfecting stoves are of course walled round, the entrance to the stoves being on the infected side, while the objects, when purified, are taken out on the opposite and clean side. What is now known as the official stoves only are used. These act by steam superheated under pressure. The temperature is generally about 118° C., and the operation does not require more than about twenty-five minutes. But these stoves have been often described. They are the same as those that are used in most parts of the world, from Belgium to the Caucasus, or from the Suez canal, at Gibraltar and on board the large ocean liners. The attendants at the Rue des Recollets declared that they had received but few complaints as to damage done to the clothes they had disinfected.

"The disinfectors, having put on their working clothes, start out to the various houses where their services are required. They are conveyed in large closed carts. On reaching the house which has to be disinfected they put on a large pair of canvas trousers and a large blouse which fits tightly round the neck and the wrists. They have with them a counterfoil book on which they inscribe on both sides all they intend to take away. One list is left with the owner, the second list is on the other half of the leaf and remains in their book. All the bedding, curtains, carpets and soiled linen are carefully folded up in canvas and securely packed. This is placed in the closed cart which is waiting in the street. The disinfectors have with them wooden jugs of 18 liters capacity, and packages containing 50 grammes of sulphate of copper, and other packages containing 7.5 grammes of bichloride of mercury and 30 grammes of tartaric acid. One of the latter packets is emptied into one of the wooden jugs and dissolved in water. The solution is poured into the pulverizer, and the disinfector proceeds to systematically work the spray over the walls and the furniture and into all the corners. The other wooden jug is half filled with water, fifteen packets of sulphate of copper are added, and then the jug is filled with more water. When the crystals are dissolved the solution is used to pour down the drains, to wash the floor and walls of the closets and to mix with the excreta of the patient that may still be found on the premises. This completes the process of disinfection. The disinfectors then remove their overalls, which are packed in a small bag and placed in the cart to be disinfected in the stoves with the bedding, &c., and before proceeding further spray themselves over with the mercurial solution. Thus the danger of spreading infection during the process of disinfection is reduced to a minimum. It will be remarked that the process of fumigation has been entirely abandoned. The Paris authorities have greater confidence in the antiseptic properties and the penetrating powers of the mercurial spray.

"In the suburbs of Paris the linen, bedding, &c., are not carried away, but a portable disinfecting stove is brought to the house and the disinfection by superheated steam is practiced in the street at the patient's door. For this purpose there are in the Department of the Seine, but outside the walls of Paris, fourteen portable stoves. With each stove there is a pulverizing or spraying apparatus.

"It is important to add that all these disinfecting operations are carried out absolutely gratuitously. No payment is demanded either from the rich or the poor.

"Disinfection was first practiced at the Rue des Recollets, because there is here a large night refuge, where nearly 300 people are given shelter for three days in the month. Persons applying for this help were required to strip, a foot-bath and douche were given them and a suit of canvas clothes provided for the night. In the interval their own clothes were disinfected, and for this purpose a disinfecting stove was placed close at hand. This stove, intended originally only for those who came to the asylum or casual ward, was the nucleus of the public disinfecting station now so well organized and so generally appreciated. The disinfecting station in the Rue du Château-des-Rentiers, beyond the Orleans railway station, had a similar origin. Here, also, there is a night refuge, organized likewise by the Paris Municipality. The washing, the douche and the disinfection of the clothes are similarly enforced. On the evening preceding my visit a poor man who was enjoying the hospitality of this asylum was taken ill a few minutes before midnight. The manager of the refuge at once removed the patient from the dormitory, poured a sulphate of copper solution on the dejections and telephoned for the ambulance. The man was promptly removed to the hospital, where he died at two in the morning. The period of illness certainly did not last more than two hours and a quarter. This is the first case of cholera that has occurred in the refuge. The next day the walls of the dormitory were treated with the mercurial spray; and 207 mattresses, 267 rugs and 414 sheets were disinfected in the stove, which is fortunately on the premises. The closets were drenched with a solution of sulphate of copper, and the street pavement outside the night refuge was washed with a disinfectant. It would be difficult to do more. While speaking of these night refuges, I might mention that the cost, including all the service, administration, &c., of receiving the poor, of giving them a foot-bath and douche, of lending them a suit of clothes for the night, of disinfecting their clothes, of giving them a good bowl of meat and vegetable soup in the evening and a piece of bread in the morning, amounts per person relieved to 55 centimes at the Rue des Recollets, and to 42 centimes at the Rue du Château-des-Rentiers.

"The third disinfecting station is in the Rue de Chaligny, beyond the Faubourg St. Antoine, and is only separated from the Hospital St. Antoine by a wall. The principle of management is the same at all the three stations. The division between the infected and the disinfected sides is strictly observed, and there are the three compartments for the disinfectors, so that they may change their clothes and take a douche when they finish work.

"At the Rue de Chaligny there is also the municipal ambulance service. The other municipal ambulance service is in the Rue de Staël, on the south side of the river, near the Boulevard Vaugirard. I will describe the latter as being the more perfect of the two. There is a small central building where three trained nurses live. On one side there are the door and the stabling for the ambulances that are ready to start, and on the other the infected ambulances that have returned from service.

These ambulances have the form of small omnibuses; they are absolutely bare inside and lined with tin, the angles being rounded off. The only furniture is an iron folding shelf that serves as a seat for the nurse. Then there are portable iron stretchers, which can be folded up in the form of an arm-chair or laid out as a bedstead. Communication by telephone or telegraph is open day and night with these ambulance stations. When the ambulance is called to fetch a patient the coachman puts on a canvas suit very similar to those worn by the disinfectors. The nurse puts on a white linen gown that fits tightly round the neck and the wrists and descends to the feet. She also puts on her service shoes. On reaching the house the coachman and the nurse, with the aid of whatever assistance may be found on the premises, place the patient on the iron folding chair, on which a small mattress and rugs have been placed. The patient is driven to the hospital, and then the ambulance returns to its station. A door close to the entrance on the infected side admits the nurse to a lavatory, where she removes her gown and her shoes and washes herself in a mercurial solution. The coachman in the meanwhile has made a bundle of the mattress and rug, which are then ready to send to the disinfecting stove. With the pulverizer he then proceeds to disinfect the inside of the ambulance wagon. The ambulance is now ready for the next case, and is sent over to the other side of the yard. At the back of the yard are the stables, where two horses are always kept ready harnessed.

"Finally, if a patient is removed to the hospital in a cab or private carriage, it will be found that the Prefecture of Police has placed a policeman at the entrance of every hospital. The cab or carriage is made to enter the yard of the hospital, and the policeman is there to see that it does not come out again till it has been disinfected. In case of a cab the cabman receives 1*s.* 8*d.* as a compensation for the delay caused by the disinfection. This, however, does not take long, being done with the pulverizer and the mercurial solution.

"Such are some of the methods and the precautions which the authorities in Paris are now adopting. They constitute a most notable improvement on what has been done during previous cholera epidemics."

So long as we cannot have such perfection of structure, we must work toward these standards. Where all these details cannot be secured, some such stove as the Ransom stove, or Ransom's hot-air apparatus, is of much service. (As to various forms of disinfecting apparatus, see Report of American Public Health Association, Vol. 12, 1886.)

New York City and some other localities are perfecting methods. The one most in use for disinfecting by moist heat is Washington Lyons' steam apparatus. Such cities as Jersey City, Hoboken, Paterson, Newark, Elizabeth, Trenton and Camden should have some such apparatus.

At the same time, we need not feel that methods or disinfectants which are not proven to be so destructive of organisms are to be dispensed with. They are of the greatest use in suspending activity, in neutralizing products, in purifying the air, in cleansing the environment and, in general, in removing the materials which impart virulence to disease and cause its spread. In their presence low forms of life find themselves without culture. So important are they that they often need to be used in addition to such articles as corrosive sublimate in order to remove stenches and purify the air. While we have yet very much to learn as to germicides and all disinfectants, we need not despair of good results from many of those which are now in general use.

SOME POINTS CONNECTED WITH SEWER LETTINGS AND THE CONSTRUCTION OF SEWERS.

BY PROF. C. M'MILLAN, PRINCETON, N. J.

The construction of sewers is occupying the attention of many places in this State. Even small and comparatively scattered towns which, under the old popular notions as to the necessary sizes and expensiveness of sewers, naturally shrank from undertaking such works, have gradually yielded to modern and more reasonable views, and are busying themselves, under the guidance of experts, some with planning sewerage works, others with instituting them in accordance with modern principles.

It is safe to say that in every place the intention of the people has been, primarily, to have their town served with sewers in a thorough manner, and, while keeping an eye upon the economic side of such undertakings, to withhold nothing that was absolutely necessary for the efficiency and permanence of the works.

But, occasionally, such good intentions are sadly interfered with by considerations of economy at times when a penny-wise policy is most likely to lay the foundation for future dissatisfaction or loss. Accordingly it is sometimes found that towns, instead of selecting their sanitary experts by painstaking inquiries through proper channels, have preferred to select them through the medium of competitive bids for professional services, in the hope, apparently, of profiting by the temptation thus held out to practitioners to offer their services for less than their usual rates of compensation in order to secure an appointment. When business in the office is "slack," this temptation is necessarily quite strong; but if yielded to, to any great extent, generally ends in regrets, for the practitioner seldom dares to imperil his reputation by doing less than he has promised. In proper professional hands the interests of a town will not suffer, whatever mistake may have been made in setting the fee for services. But what committee or Board of Works is competent to discriminate safely and fairly between different proposals to furnish complete plans of sewerage for a place of about 25,000 inhabitants for prices ranging from $800 to $3,700, as was the case in the bids received in reply to advertisement by a certain city in a neighboring State? Or how would different invited proposals to plan and superintend the sewering of a town for rates of compensation which varied from 3½ per cent. to 10 per cent. of the estimated cost of construction, as in a case nearer home, convey to the mind of the average municipal officer a clear idea of the services which it would be to the best interest of the town to secure? It may be readily guessed, in this last case, that the proposal of 10 per cent. was not the one accepted, although made by one of the most eminent sanitary engineers of this country.

It is reasonable and proper, of course, that municipal officers should aim to have good work done for as low a price as it can be done for properly, but to endeavor to bind a contractor to do that work for less than it will cost him is quite another thing; and a singular feature of such cases is that neither the sharp contrast between the lowest bid and the engineer's estimate, nor the assurance of the engineer that the specified work cannot be done properly for the prices quoted, has any weight in restraining officers so disposed from accepting anything that appears in the form of a bid, so long as that bid is low and has the names of satisfactory bondsmen attached to it.

The state of things adverted to, when it exists, is seldom the result of a deliberate design or intention on the part of Boards of Works to perpetrate an injustice, but generally arises from ignorance, and from eagerness to make a good showing in the administration of public affairs. The members of such Boards do not understand the full significance of the technical clauses of the specifications; they do not know the proper market value of the work called for; and, while ready to admit that the lowest bidder is often tricky and a source of real loss to those who employ him, they dislike to admit that he may prove to be such in their case, and will dispose of any unpleasant reflections with the comforting conclusion that the engineer is paid to take care of him. Just what this may mean to the engineer who has accepted the supervision of the work on a percentage can be realized only by those who have encountered a recalcitrant contractor's ingenuity in devising means for deceiving, cajoling or browbeating the inspectors, and in making himself annoying generally.

Assuming that errors in the steps which constitute the preliminaries to the construction of sewers are more largely due to ignorance than anything else on the part of officials, it is proposed here to touch on a few points the importance of which is not generally understood, and which are quite within the scope of a layman's comprehension.

Whatever else may be said of it, it is not wise to auction off, so to speak, the planning and superintendence of the work. It may seem like a reasonable measure of economy, but the objections to it are much the same as those which would naturally be urged against the selection of a family physician through the medium of competitive bids. It is always easy, with the aid of advice from a State Board of Health, to engage a thoroughly experienced and competent sanitary engineer, at a fair rate of compensation, for which he can reasonably be expected to give the subject presented to him the most thorough attention and treatment.

The plan having been made by a competent engineer, it is not wise to let the work of construction for a sum much below the engineer's estimate.

Of course, the engineer is not infallible; but his training makes him alone capable of deciding on the quality of material and workmanship required in any particular case and the special precautions to be observed, while his careful examination of the ground, and his knowledge of current prices for labor and materials, should make his estimate more reliable than those of bidders who differ sometimes by between twenty and thirty per cent. from each other. He is under no temptation to misrepresent the probable cost of the contemplated work, but, on the contrary, the success with which he is able to forecast the probable expense of an undertaking constitutes part of his professional reputation.

The lowest bidder, on the other hand, is notoriously lax in interpreting specifications, and is more or less buoyed up by the hope that, by having recourse to the many expedients with which contractors ot a certain kind are familiar, he will be able, after the acceptance of his bid, to make the actual cost of construction match with his figures, or that he will find easy refuge and consolation in "extras." A low bid *may* sometimes represent the contractor's actual estimate of the value of the work based on his experience elsewhere, but it seldom, if ever, represents his estimate of the value of work executed in accordance with rigid specifications; and if the truth could be ascertained, the lowest bid would be too often found to be coupled with mental reservations which, if known, would vitiate the contract.

The point which it is desired here to make is that, excepting those cases in which the selection of the lowest bidder is made compulsory by law or charter, the engineer cannot be of greater service to a municipality than by guiding its officers towards a wise selection of their contractor. He can more surely than anyone else ascertain the skill and experience of each bidder and his reputation for fair dealing: and a fairly-earned good repute in these particulars on the part of a contractor is really worth more as a promise of faithful performance than heavy bonding.

It must be remembered that the designing of a system of sewerage for any given place is a distinct problem, the solution of which depends at all points on the particular conditions and needs there found. It is true that a proper design will necessarily contain many features which are common to systems of sewerage generally, but every case will present to the professional eye peculiarities which are unique, which distinguish that case from all others, and which therefore call for a great deal of careful thought, and a skillful adaptation of general principles and rules. Whether the case demands the institution of a "separate system," in the strictest sense of the words, or whether roof-water may be admitted to the sewers, or whether a "combined system" is called for, or lastly, whether the system shall be in part separate and in part combined, are questions not to be hastily or arbitrarily answered. The mode of disposal (one of the first points to be inquired into and in a general way decided upon) has naturally a most important bearing upon the above questions; for if the sewage has to be pumped to an outfall, or requires treatment or purification before it is disposed of, every gallon of water unnecessarily admitted into the sewers will add to the operating expenses. The size of the town or of a district thereof, the density of its population, the depths to be reached, with thorough drainage in order to serve existing cellars and sub-grade stores, offices, &c., and the ease or difficulty, as the case may be, of providing surface drainage for the streets, also have weight in determining the kind of system to be adopted.

The alignments and grades proposed for the sewers will be shown by the plan and profiles. It is permissible to depart from them, under the guidance of the expert, to a slight extent during construction, when occasion requires, but all extraordinary deviations therefrom should be provided for by the terms of the contract. To these drawings will be added others illustrative of the appurtenances of the sewers, which are so represented as to be readily adapted to different locations, depths, &c. But the ruling idea of the design as to the quality of material and workmanship necessary to insure the proper execution of the works and their efficient operation is set forth in careful specifications, and these should never be departed from.

Whatever may be the eminence of the sanitary engineer who will have prepared the design, it is not only proper, but desirable, to have the matters presented by him examined and inquired into by the officers and taxpayers of the town until a full opportunity has been given for the presentation and proper consideration of criticisms or objections. Indeed, an expert conscious of his ability to satisfy all reasonable doubts will invite rather than avoid intelligent criticism, in the hope of securing thereby a closer study by the people of his scheme, and their better apprehension of its principles, features and operation; and he will always prefer that whatever objections may be made should appear before construction begins. Even should his explanations or arguments fail to be convincing, and should the importance of the points at issue be sufficient to warrant the step, he will probably be the first to suggest the convening of a commission of engineers, of at least equal professional standing with his own, to consider and decide upon those points.

But after the working plan has been adopted, the contract let, and construction begun, it would be the height of folly for the people to tolerate or be indifferent to any attempted interference, from whatever source, with the proper execution of the accepted design in the strictest accordance with the prescribed specifications. It seems necessary to emphasize this, for it is not uncommon for a losing contractor to seek adroitly to spread disaffection among officials and citizens, by misrepresenting the design, misquoting the specifications and the orders emanating from the engineer, and by other means to which a desperate or unprincipled man will resort; the object of such a course being to create a confusion of which advantage may be taken, and to prepare the way for more formal misrepresentations and complaints. It would be unnecessary to advert to this were it not that such a course, skillfully pursued, results more frequently than would be supposed either in rendering the efforts of the engineer to secure proper work futile and his position intolerable, or in the appending to the contract of a supplementary agreement whereby the contractor profits, of course. While such results cannot be reached without interference by some of the officers of the municipality, it is not necessary to assume that their action is prompted by corrupt motives. That it is so prompted sometimes is, unfortunately, a fact, but their course is often largely the result of ignorance, incapacity for taking a judicial view of a question and, therefore, inability to see their own positions and the positions of the contractor and the engineer in their true relations towards each other and to the work in hand; and not infrequently does such interference spring from a jealousy in the official mind of the almost exclusive authority over the contractor given to the engineer by the specifications; the privilege of exercising control being too precious to be voluntarily surrendered for any purpose by a person who has accustomed himself to regard his advice and opinion as indispensable elements in the proper guidance or management of municipal affairs.

Sewer-pipes and their proper laying are probably the most frequent subjects of contention, although other materials, according to their prominence in the work, as well as the modes of putting them together, will sometimes claim the bulk of the debate as soon as the contractor discovers that he has bid too low to admit of his faithfully executing the work except at a loss.

A properly-designed system of sewers will be self-cleansing—that is, the velocity of flow will be sufficiently great to carry forward all matters of which the sewers are proper receptacles, as fast as those matters reach them; or else, in the case of low grades, provision will have been made for flushing—literally, washing—the sewers with frequent charges of clean water in such a manner that whatever deposits may have occurred in the natural flow will be broken up and driven forward by the next succeeding flushing charge. The fouling of the sewers will thus be reduced to a minimum. Leaving out of consideration questions of strength and stability, the design is therefore largely a problem in hydraulics, into which enter not only volumes of flow, sizes of sewers and available grades, but also the degree of roughness or unevenness of the internal surfaces, and the perfection with which the sewers are laid. Now, it is quite possible, by the use of improper materials, or by slovenly construction, to convert what was designed to be a clean sewer into a sewer of deposit, or, at least, a foul one; and it is to prevent such and similar frustrations of the purpose of the designer, and other violations of good practice, that stringent specifications are written, and carefully-chosen inspectors are placed over the work, charged with seeing that those specifications are carried out at all points.

Pipe sewers are made of clay or earthenware pipes thoroughly baked, or burnt, and otherwise prepared for the purpose for which they are designed, for the simple reason that such pipes are much cheaper than iron pipes of equal size, and because, if properly made, they are, under ordinary conditions, equally durable. They are manufactured in lengths of from two to three feet. In order to decrease frictional resistance and to diminish the tendency of the slimy contents of the sewers to adhere to the pipes, they are required to be thoroughly and smoothly glazed, especially on the inside, thus rendering the pipe non-absorbent, and furnishing a smooth, glassy surface for the sewage to run over. This is an important requirement in any case, but especially so in sewers of moderate or low grades. The pipes should, moreover, be strong and sound, true in form, longitudinally as well as crosswise, and must be of homogeneous material and thoroughly hard-burnt, as that affects their durability. All these requirements, and others which the engineer will add, should be carefully and somewhat particularly set forth in the specifications, and should be insisted upon during construction almost to the letter, as without these qualities it is impossible to build first-class pipe sewers.

Of fully equal importance is it that the alignments, both horizontal and vertical, as given instrumentally by the engineer, be most closely adhered to, and that the specifications for the laying of pipes, for the selection and manipulation of jointing materials, for the making of joints, and for the backfilling around each finished length, be not deviated from. Nor should the proper preparation, or grading, of the bed or bottom of the trench upon which the pipes are to be laid be counted a simple matter. None but skilled laborers should be allowed to grade the bottom, inasmuch as inexperienced hands will leave many a hump in the bottom which, though scarcely perceptible to the eye, may be sufficiently large and so situated as to furnish a fulcrum on which the pipe, when laid, will rock. Of course, a broken joint is apt to follow. In clayey soils, after rains, the bottom of the trench is more or less plastic and therefore untrustworthy as a support for the pipe. The remedy in such cases is to remove the softened material until firm earth is reached, and to fill the space thus made, up to the level of the bottom of the pipe, with gravel, coarse sand, screenings from Macadam stone, broken stone, or concrete, thoroughly compacted, before laying the pipe thereon. A contractor will not infrequently try to avoid the preparation of the bed required in such cases, for the simple reason that it may be classed in the contract as part of the regular work agreed upon instead of as extra work, and that he is not entitled to extra compensation therefor.

The joints of pipes are made by packing into the space between the bell and spigot, or between the collar and the pipe which it overlaps, either a paste of pure hydraulic cement or a mortar consisting of a mixture of cement and sand. The former is preferable in wet trenches; the latter, which is resorted to on the score of economy, is commonly used in dry trenches. The quality of the cement as to rapidity of setting may be varied with good effect according as the trench in which it is to be used is wet or dry: ordinarily a moderately slow-setting cement gives satisfactory results in pipe sewers through which rain-water from the trench is not allowed to run, provided it is also strong; but in wet trenches, a quick-setting cement of high grade is preferable for the joints. There is a risk, however, in the use of quick-setting cement in that, owing to the rapidity with which it hardens after being wetted, the workmen will be constantly attempting to retemper (moisten and break up into a paste) the mortar, and that they will sometimes succeed in doing so in spite of vigilant inspection. The use of retempered mortar in the joints in a wet trench is likely to result in a leaky sewer.

The entrance of ground-water in moderate amounts into sewers is not always to be regretted, for it effects a permanent lowering of the water with which the subsoil is saturated and, in low-lying occupied districts, helps to keep dry cellars which may previously have been subject to flooding by subsoil-water. Therefore, if the disposal of the sewage requires no preliminary treatment, or purification, it may be a positive advantage to use the sewers for draining districts which are in need of subdrainage, instead of endeavoring to accomplish the same result through an independent system of drains, provided that a proper allowance or margin has been added to the sizes of the sewers to accommodate the extra flow. But it would be extremely unwise, to say the least, to use such a statement as an argument for admitting ground-water to sewers in the haphazard way which is the result of imperfect workmanship, or as an excuse for the acceptance, or passing, of improperly-made joints. The proper methods of admitting ground-water to sewers are perfectly well known, and are based upon the principle that no openings in the joints should be tolerated at a lower level than that of the surface of the greatest flow: the same openings which under external pressure permit water to leak into the sewers may, if they are below the flow line, allow sewage to leak out into the subsoil during dry seasons.

Without going into further particulars, it will be sufficient to say that the execution of good sewerage depends not only on the adoption of a proper plan and on a strict adherence to it, but also on an unswerving insistence at all points of the work on the fulfillment of the specifications which will have been prepared for the very purpose of insuring the proper execution of the plan and the efficiency of the work.

In preparing this paper, the writer has no expectation that practitioners will find anything new in his remarks. He is actuated solely by the hope that, through the publications of our State Board of Health, he may be able to reach persons who have an official interest in the planning or construction of a system of sewerage, and that, possibly, by impressing them to some extent with his views, he may be the indirect means of making easier the lot of some municipal engineer entrusted with the construction of sewers, and his endeavors to secure good work more satisfactory and sure.

Much has been said herein which may possibly be construed by some as reflecting upon municipal officers and contractors generally. To prevent such a hasty conclusion, the writer takes pleasure in adding that there have been, and are at present, official boards in different parts of this State who, by their clear apprehension of what a contract means, and by their loyal support of their professional adviser, have actually driven what at times seemed to be unpromising undertakings to satisfactory conclusions; also, that the writer has met contractors in this State who, in a quiet way, had earned and were maintaining a creditable reputation for skill and probity. Unfortunately, however, such contractors are apt to appear at sewer lettings among the higher bidders, except in undertakings which are extra-hazardous, and which, therefore, frighten away more timid or inexperienced men.

TOBACCO AND ITS EFFECTS ON YOUTH.

BY LABAN DENNIS, M.D., NEWARK, N. J.

For three hundred years the judgments of men have been divided on the subject of the use of tobacco by adults. We shall here present the testimony as to its use by the young. We shall endeavor to state fairly both sides.

An American plant, tobacco, was taken to Europe soon after the discovery of this continent. It was in use by the Indians in three ways, by pipe, or cigar, and as snuff. Its use now extends over the world.

Tobacco has for its most active principle a substance called nicotine, composed of nicotine proper and a bitter extract. The smoke also contains carbon, ammonia, an empyreumatic substance, carbonic acid and carbonic oxide. The effects of these substances on the body are, briefly, these: Free carbon is an irritant, and discolors the bronchial tubes and teeth; ammonia bites the tongue, produces dryness of mouth and throat, excites the salivary glands, and has a solvent influence on the blood; carbonic acid and oxide are poisonous and produce drowsiness, headache, lassitude; the latter, unsteadiness of heart, tremulous and convulsive movements of the vessels and vomiting. Nicotine proper produces in man vomiting, purging, sinking at the stomach, vertigo, palpitation of the heart and muscular weakness. It causes death quicker than any other poison except prussic acid. (Stillé.) One thirty-second of a grain causes toxic symptoms in man, and one-sixteenth of a grain has produced muscular spasms and other effects lasting three days. The empyreumatic substance causes oppression and bad odor to breath; the bitter extract, bad taste and vomiting. The effect of the smoke on animals, such as cheese mites, flies, bees and wasps, is to cause convulsions and death. One of the first effects of the smoke on the stomach is nausea and vomiting. Next, it affects the nervous system, producing dizziness, muscular tremors and spasms;

these reaching to the muscles of the chest and the heart produce deathly faintness and tremors, with sensations of impending death, terrible to witness, and accompanied by shooting pains through the chest when attempting to breathe. Pushed still farther, death results from arrest of heart action.

In learning to smoke, the brain is rendered pale and empty of blood, the stomach red in spots, the blood is preternaturally fluid, the lungs are pale, the heart is overburdened with blood and is unable to do its work of contracting, but is fluttering and feebly trembling, and were the cause not removed would cease soon to beat entirely. This process being repeated again and again, the organs become accustomed to the poison and tolerate it with less disturbance, and the lungs, the skin and the kidneys carry out of the blood the disturbing agents; hence the odor of the breath and the perspiration. Herein lies the whole gist of the argument for and against tobacco. It is, in the main, a functional disturber, and does not produce organic disease. If carried too far, or too frequently repeated, the results may be structural changes in various tissues, or such disturbance of function as to endanger life.

Passing over the details of the functional disturbances of the various organs which are affected by tobacco, we may say, in brief, that smoking produces in the blood impoverishment, with debility, nausea and vomiting. Mouth—sore tonsils and throat, red and dry membranes and sponginess or hardness of gums. Heart—debility and irregular action. Lungs—sustains irritation and increases cough. Eye—dilation of pupil, confusion of vision, specks, changes in retina. Ear—ill-defined sounds, ringing. Brain—impairs activity and narcotizes (soothes if exhausted). Nerves—paralysis, over-stimulation of secretion.

Now let us see what functional disturbances are produced in various organs by the inhalation of tobacco smoke. The blood is made thinner and paler than natural, making the body white or yellowish. If it becomes too thin, bleeding from a wound, *e. g.*, is stopped with difficulty; the red blood globules become shrunken and irregular in shape and lose their natural cohesiveness, and present such an appearance as is seen in those who are depressed in physical and mental power. When the cause is removed the blood quickly regains its natural qualities.

On the stomach marked effects are produced. The natural appetite is impaired, and the tobacco seems to take the place of food, probably, in part, by benumbing the acute sensibility of the nerves which give the sensation of hunger. The bitter extract produces redness and irritation of the mucous membrane whose duty it is to secrete the gastric juice for the digestion of the food, so that the amount secreted is often less and the quality lowered; hence digestion is impeded and acrid fluids are left behind, giving rise to heartburn, nausea, and debility of stomach.

Nicotine stimulates the muscular coats of the stomach and bowels, and in moderate quantity often acts as a laxative; in excess, it paralyzes their muscles and produces debility and constipation. As the whole body depends upon good digestion for an adequate supply of nourishment, whatever impairs that must affect injuriously, in the end, every tissue and function.

Old, foul pipes, saturated with nicotine and bitter extract; strong tobacco; also the taking of snuff and the chewing of tobacco, so that the juices are absorbed more easily, are most harmful. The cigarette and the cigar smoked to the end are also bad. Hence the deathly pallor of boys smoking stumps about the streets.

In the mouth, the smoke increases the flow of saliva by its action on the salivary glands. This saliva sometimes deposits on the teeth a crust of lime salts, called tartar.

To the throat, the smoke produces redness, irritation of the mucous membrane, dryness, and a large, soft, sore condition of the tonsils, rendering swallowing painful, and by its irritation of the vocal cords produces in speakers and singers hoarseness and lack of control of the voice.

No positive connection between cancer of the mouth and throat or lips and the use of tobacco has been established, except that where one is predisposed to cancer, any irritant may serve to excite it, such as the presence of the smoke in the mouth or the pressure of a short, hot pipe upon the lips.

As to the heart, excessive smoking interferes seriously with its contractile force, producing irregularity, palpitation, a feeling of oppression and faintness, with breathlessness and insupportable pain in the region of the heart, which sometimes extends to the muscles of the chest and left arm.

As to the lungs, while it cannot be said that consumption and bronchitis are primarily due to the use of tobacco in those so afflicted, yet it must be accredited with some influence, since in the Royal Infirmary of London out of 479 males affected with these diseases, 57 per cent. were smokers and only 43 per cent. non-smokers. It must be conceded, too, that when once these diseases are set up in the system, smoking aggravates and confirms them. When any cause is operating to produce them, smoking tends to make it more powerful. It does this by poisoning the air breathed, by impoverishing the blood, and by enfeebling the digestion, all of which are most damaging in both consumption and bronchitis.

On the eye, smoking may produce an unnatural dilation of the pupil and thus impair vision in a strong light by admitting too many rays. Another effect is the retaining of images upon the retina, especially bright objects, for some minutes after the eye has been turned from them. Partial loss of vision, termed ambliopia, the result of the shriveling of the optic nerve, may also result from excessive smoking, and it may appear without any other evidence that the tobacco is doing harm to the system. (Noyes.)

Hearing may be impaired for feeble or loud sounds, and sometimes a peculiar ringing, lasting for several minutes, is produced in the ears. Upon the brain, the ill effects of smoking may be manifested in vertigo, weakness of memory and loss of power of concentration of the mind. In most persons the power of continuous thought is impaired by the use of tobacco, if it is taken while the mental effort is in progress; but, if used after the work is done, many feel a sense of relief and quiet from its action. Some, after very protracted use of the brain, become too tired to sleep, and find then the pipe or cigar acts as a sedative.

The spinal nerves may be so affected as to give rise to tremors and spasms of muscles, followed by paralysis. By the action of smoke on the so-called sympathetic nerves, which regulate glands, their action may be much increased and afterwards diminished. Thence arises increased flow of saliva, gastric juice and pancreatic fluid, which assist the process of digestion. Later, this increase is followed by a reaction of the opposite sort, and hence arise dryness of the mouth and throat, dyspepsia and constipation of bowels.

Prof. Wm. G. Thompson, of the New York University, in an article on the "Tobacco Habit," says at the close, in regard to the question, "Is smoking injurious?": "No brief answer can be truthfully given, but the following summary of the facts may be stated:

"I. Both individuals and nations have attained the highest intellectual and physical development without the use of tobacco in any form.

"II. Tobacco is in nowise essential for the welfare and progress of mankind.

"III. Tobacco, like alcohol, is positively injurious: 1, to the young; 2, to those suffering from certain maladies, notably heart and lung diseases; 3, to those who have a marked susceptibility to it, or who have a highly-sensitive nervous system; 4, to those who have not sufficient will-power and force of character to enable them to restrict its use properly; 5, to every one, if used to great excess.

"IV. Many inveterate smokers have lived to be over ninety, or even one hundred years of age, without having their health affected by the use of tobacco.

"V. All nations and all races ascribe value to the use of tobacco as a sedative for the relief of fatigue and *ennui*. Smoked in moderation after meals, it stimulates secretion, aids digestion, and increases the action of the bowels. Many find in it a soothing influence; it promotes reverie, overcomes weariness, and, as a moderate stimulant, in a limited degree it takes the place of scanty food.

"VI. Those who have passed middle life, and whose physical, emotional, or intellectual faculties are overburdened with the activities of modern civilization, often find that tobacco favors mental and physical calm and counteracts nervousness and exhaustion.

"VII. An enormous number of persons do use tobacco constantly without any ill effects whatever; although the tobacco habit is seductive, and, once thoroughly established, it tends to grow beyond easy control."

We have thus far made our statements as to the use of tobacco general, and have quoted from the best and most recent medical authorities without regard to their judgment for or against its use. Propositions IV. and VII. are open to serious question, and, were we discussing the general subject of the use of tobacco, would be examined critically.

Now let us see what distinguished physicians say of its use by young persons.

Dr. D. E. Lincoln, in his work on Industrial Hygiene, says: "With regard to workers in tobacco, it is said by Tracy, of New York, that they have very small families, quite the reverse of what is the case usually with working people. He found only 465 children in 325 families. This is quite probably due to the premature commencement of work, and to the influence which tobacco has in checking the sexual growth in young girls. It is certainly desirable to keep young persons under sixteen from its use."

Dr. Richardson, one of the most distinguished of English physicians, says: "As the human body is maintained alive and in full vigor by its capacity within certain well-defined limits to absorb and apply oxygen; as the process of oxidation is most active and most required in those periods of life when the structures of the body are attaining their full development; and as tobacco smoke possesses the power of arresting such oxidation, the habit of smoking is most deleterious to the young, causing in them impairment of growth, premature manhood and physical degradation."

Dr. Gibson, Medical Director of the United States Navy, in his report on the United States Naval Academy, says: "That so many adults use tobacco with apparent impunity, or even admitted benefit, is no argument in favor of its use by growing lads, for while tobacco, by arresting muscular waste of tissue in the mature man, may help to maintain the integrity of the organism, in those coming to maturity this very effect is detrimental, since it retards that progressive cell-change upon which the advanced development of the body depends."

Dr. Gorgas, Medical Inspector, United States Navy, says: "The use of tobacco by youths can never be regarded as moderate. Its effects, even when but little indulged in, are those which characterize excess in adults. The depressing effect of tobacco upon growth, by diminishing the forces concerned in tissue change, its effect upon the heart and pulsation, the disturbance of muscular control, of ability to concentrate the mind upon study, the dyspeptic troubles, impairment of vision, headaches, and the retardation of sexual development and disturbance of that function, are conceded by most observers, and clearly demonstrated by many."

Prof. Oliver, head of the Department of Drawing in the Naval Academy at Annapolis, has observed in the pupils addicted to the use of tobacco not only trembling of hand and inability to control perfectly, muscular effort, but also some defect of the mind or the eye, so that the direction of lines is not properly understood or perceived. He says: "In an experience of fourteen years, many thousands of drawings having passed through my hands, I have had occasion to challenge cadets on their use of tobacco in smoking, as evidenced by their work, and I have in no instance made a mistake."

In 1875, on the recommendation of a board of medical examiners appointed to consider the effects of tobacco upon the cadets at the Naval Academy, Admiral Rogers, the Superintendent, issued an order prohibiting its use in any form. In 1879 this order was rescinded. In 1881 it was again issued, and at that time all the officers of the institution who had before favored the plan of unrestricted permission to smoke, confessed that the experiment had been a failure. The medical inspector of the institution reports only one-half the number on the sick list for minor ailments during the period of prohibition as compared with that of unrestricted use.

In June, 1881, its use was also prohibited in the Military Academy at West Point, on the recommendation of the Board of Visitors.

The London *Lancet*, one of the most powerful medical journals in the world, in an editorial (November 4th, 1882, page 765), says: "To the young, tobacco is injurious in any form or quantity, and at all times, because, owing to the stage of development, the nicotine, which it is impossible to prevent passing off with the smoke, is in all doses hurtful and even poisonous." Again, the editor says: "Those [adults] who are unfavorably affected by it should abstain, and it is wholly inadmissible in youth. We should go so far as to say that no young man should smoke before he has attained his majority, and it would be well if he deferred the use of tobacco altogether and in every form until the extreme limit of development, which may be placed at the age of 26."

The *Lancet* of June 9th, 1883, page 1011, quotes some facts submitted by Dr. G. Decaisne to the Society of Public Medicine, in France, on the effects of the use of tobacco among 38 boys submitted to his care, varying in age from 9 to 12 years. Twenty-two of them had distinct disturbance of the circulation, unnatural sounds of the valves of the heart, palpitation, deficiency of digestion, sluggishness of the intellect, and a craving, more or less pronounced, for alcoholic drinks. In 13 there was an intermittent pulse. In 8 analysis of the blood showed a marked falling off in the number of red corpuscles. Twelve suffered from frequent nose-bleeding. Ten complained of agitated sleep and constant nightmare. Four had ulcerated mouths, and one became a victim of consumption, which the Doctor thought due to the great impoverishment of blood from the use of tobacco. Eleven had smoked for six months, 8 for one year, and 16 for more than two years. Out of 11 who were induced to cease smoking, 6 were completely restored to normal health after six months, while the others continued to suffer for a year. "The use of iron and quinine gave no satisfactory result," he says, "and it seems tolerably evident that the most effective, if not the only cure, is at once to forswear the habit, which to children, in any case, is undoubtedly poisonous."

Dr. Kitchen, in the New York *Medical Record* (April 27th, 1889, page 459), says of the use of tobacco: "Its interference with intellectual activity is marked. It is said that during a period of fifty years no tobacco-user stood at the head of his class in Harvard. The accumulated testimony of investigating observers is conclusive that, other things being equal, users of tobacco, in schools of all grades, never do so well in their studies as non-users. One head of a public school said he could always tell when a boy commenced to use tobacco by the record of his recitations."

Dr. Wm. A. Hammond recently said in the New York *Tribune*: "In France the difference between the students in the polytechnic schools who smoked cigarettes and those who did not, in scholarship, as shown by their respective class standings, was so great that the government prohibited absolutely the use of tobacco in all the government schools."

Prof. Hinds, Professor of Chemistry in the Cumberland University, Lebanon, Tenn., says: "In all my experience with classes of young men as a teacher, I have found that in all competitive examinations the smokers were far inferior to the others. Our best college students are always free from this pernicious habit."

Mr. Higginbottom, an English writer in the *Lancet*, says: "After fifty years of most extensive and varied practice in my profession, I have come to the decision that smoking is the main cause of ruining our young men, pauperizing the workingmen, and rendering comparatively useless the best efforts of ministers of religion. The proverbial drunkenness of our countrymen can only be arrested by laying the axe to the root of its superinducing cause—the thirst-creating power of tobacco."

Dr. Roberts Bartholow, one of the leading physicians of Philadelphia, and one of the ablest and best-known writers on medical subjects in the United States, in a recent article on cigarette-smoking, says: "It is high time that something were done to put a stop to this frightful evil, which is stunting the growth and ruining the health of thousands of boys. It is just horrible to see these boys, little fellows many of them, not more than eight or ten years old, not street boys, but well-dressed and carefully-nurtured boys, gathered in knots in some corner, where they think they will not be observed, learning to smoke. Parents see their sons getting thin and yellow and irritable; the family doctor is called in, and, without going to the root of the evil, prescribes tonics, which do no perceptible good. The prodigious increase of cigarette-smoking among boys in the last few years is an evil which will tend to the deterioration of the race if it is not checked. But it is not hard to account for. Boys are very imitative. They follow the fashion with promptness and zeal. Cigarettes are the rage at Harvard. It is the correct thing to smoke these poisonous little rolls of tobacco and paper. Whatever is fashionable in a great school like Harvard is sure in a very short time to be fashionable among young men and boys all over the country. Another great cause of mischief is that boys are very fond of imitating their elders. Smoking in public places ought to be discouraged. There ought to be a sentiment created against it, and the press is the power to create such a sentiment."

In a recent publication called "Study and Stimulants," by A. A. Reade, are given the opinions of various eminent men, in literature, science, art and theology, both in our own and foreign lands. The author says in his conclusion, after weighing the testimonies of these writers: "One thing is clear, however, that our best writers, clearest thinkers and greatest scholars do not regard the use of alcohol as essential to thinking, and very few find tobacco an aid." It is a remarkable fact that out of twenty eminent men of science only two smoke, one of whom, Prof. Huxley, did not commence until he was forty years of age. Mr. Reade says: "To the young, tobacco is bad in any form. It poisons their blood, stunts their growth, weakens the mind and makes them lazy." Says Mr. Ruskin: "It is not easy to estimate the demoralizing effect of the cigar on the youth of Europe, in enabling them to pass their time happily in idleness."

At Yale, the Class of 1880 was divided into four sections, according to scholarship. Of the first or highest section, 25 per cent. used tobacco; of the second, 48 per cent.; of the third, 70 per cent., and of the fourth, or lowest, 85 per cent., showing that there were three and one-half times as many smokers among the poorest scholars as were found among the best.

Says Oliver Wendell Holmes: "I do not advise you, young man, to consecrate the flower of your life to painting the bowl of a pipe, for, let me assure you, the stain of a reverie-breeding narcotic may strike deeper than you think. I have seen the green leaf of early promise grow brown before its time under such nicotian regimen, and thought the ambered meerschaum was dearly bought at the cost of a brain enfeebled and a will enslaved."

What are the facts from actual measurements? Those of Amherst and Yale are as follows:

The graduating class of 1891 at Yale contained 187 men. The non-users of tobacco, during the college course, had gained over the users, in weight, 22 per cent.; in height, 29½ per cent.; in girth of chest, 19 per cent.; in lung capacity, 66 per cent.

At Amherst, same year, 53 men. Gain of non-users over users, in weight, 24 per cent.; in height, 37 per cent.; in girth of chest, 42 per cent. In lung capacity, the users had lost 2 cubic inches of air space, while the non-users had gained 6⅓ cubic inches.

In the matter of scholarship at Yale, in the same class, of those taking what is known as "Oration Stand," embracing about one-sixth of the class, only 5 per cent. were smokers; "Dispute Stand," one-sixth of the class, 12½ per cent. smokers; and "Appointment Stand," one-half the class, $15\frac{7}{10}$ per cent. smokers. Of the whole class, 30 per cent. were smokers.

Of the 12 highest-rank men, 1 used tobacco.
Of the 37 highest-rank men, 3 used tobacco.
Of the 72 highest-rank men, 14 used tobacco.
Of the 126 highest-rank men, 32 used tobacco.

Dr. Seaver, speaking of these facts, says: "The relation of growth and the use of tobacco is a matter of vital interest. The fact that these men have nearly reached the maximum in height when they enter college, while they are not 'filled out,' and consequently do and should increase more relatively in such matters as chest girth, would lead us to expect a large growth in lung capacity, and the disparity in the actual results obtained are, to me, at least, rather startling. The effect of tobacco in obstructing growth is a problem worthy of more thorough study. * * * The effect of tobacco on the mental powers is not so easily demonstrated. We can, at least, say that if the use of tobacco does not have a decided deteriorating influence on mental processes, then the same original qualities of mind and character that enable a person to become a great scholar do also strongly tend to keep him from using it."

The Manhattan Athletic Club has recently sent a team to Europe to meet the best athletes of England, France and Belgium. The champion of that team is Malcolm Webster Ford, who is said to be a fine example of the connection of mind and matter, since, although not inheriting unusual physical strength, his parents being of a literary turn of mind, his father the owner of the largest private library in Brooklyn, his grandfather a Professor in Amherst and Yale, and his great-grandfather the famous Noah Webster. By the systematic and harmonious development of the whole body he has come to be regarded by good judges as the greatest combination of strength, activity and endurance that the athletic world has ever seen. A critic of good judgment, says of him: "To-day, properly trained, he could defeat any amateur in the world in an all-round contest. His regular habits must have had a great deal to do with his successful career as an athlete. He does not use tobacco in any form nor indulge in any excesses."

In support of the opinion that tobacco is a source of injury to athletes in general, let me mention the testimony of those who are training the muscles of the boating crews and foot-ball teams of our principal universities. You are aware that the contests between the Harvard, Yale and Princeton foot-ball teams surpass in interest and excitement any other single athletic events of the year. By reason of this the struggle in each of these to get upon the team is intense. Every man chosen to represent his university feels himself honored in a peculiar and distinguished manner, in that the eyes, not only of his own college but of the rival institutions, and in fact, of the whole athletic and literary community of the Eastern and Middle States are upon him.

The men are tested in various ways, but chiefly by practice in the game, even in the Freshman year, and their records are closely watched. The fittest in point of size, weight, speed in running, agility in dodging, coolness in excitement, staying power under exhausting labor, great muscular strength, skill in outwitting opponents, lung and heart power, as evidenced by good wind and steady pulse, are selected to represent the college in the great matches. These men are then trained in accordance with the best scientific and practical knowledge to be had at their respective seats of learning, conjoined with the experience of athletes the world over, in every line of physical development, and this for months and years, in order to get the very best results out of them in the supreme, final struggle. Their food, drink, hours of sleep, labor and recreation, and their use of tea, coffee, stimulants and tobacco are matters of strict regulation. Now, what are the facts in regard to the use of tobacco in these teams? In reply to personal letters addressed to these three universities, I received these answers:

Dr. D. A. Sargent, director of the gymnasium at Harvard, who has done more, perhaps, to systematize gymnastics and put them upon a scientific basis than any other living man, makes this reply: "I have no printed directions with regard to diet. In some cases tea and coffee are excluded, and in all cases stimulants and tobacco."

From Yale, a member of the Sophomore class writes me: "The use of tobacco is not allowed to men in any of the athletic teams or crew. A man that would not stop smoking would not be taken on a team, nor do I think would try to get on, as it cuts the wind, so that he would surely not be able to do the heavy work required."

A member of the Senior class in Princeton writes me: "Our trainer, Robinson, said that he was very severe on the use of tobacco, especially cigarette-smoking, and that he would put the man who indulged in it off the team in a minute. He said that tobacco injured the lungs, and was very bad for a man's wind.

"While I don't think he knows very much about the scientific aspect of the subject, I am positive that he is well posted as to the practical workings. Robinson is probably as good a trainer as there is in the country. He has been secured by the Manhattan Athletic Association, and is here only for the foot-ball season."

The Treasurer of the Princeton Foot-Ball Association, after full conversation with the trainer, writes me: "The team is absolutely prohibited the use of liquor and tobacco."

Thus it will be seen that in all three of the great universities, where the results have been watched and tabulated for years, the use of tobacco in any form is absolutely prohibited to those who are seeking to make themselves, as nearly as possible, perfect specimens of physical manhood.

The medical or physiological reasons for this prohibition we are prepared to appreciate from our study of the effects of tobacco smoke upon the various tissues of the body. A thinned, watery condition of the blood, tremulous and unsteady muscles, weak and shaky nerves, imperfect sight and hearing, diminished lung capacity, and a palpitating, irregular and feeble heart action are not the elements that make a well-developed man. Rest assured the opposites of all these are just as essential to fit a man for the struggle of life as for the foot-ball match or the rowing contest. Precision of muscular action, as in drawing, writing, painting, engraving and the like, and the thousand operations, mental and physical, which require a man to be at his best in order to succeed in the intense competition of the present day, are rendered more difficult and often impossible of execution by indulgence in tobacco.

In addition, however, to the imperfect development of the individual, must be noticed the early deterioration of his reproductive powers. This fact, coupled with the increasing tendency to later marriages than formerly, must in time make serious inroads upon the growth and perpetuity of the families whose members smoke in youth.

Next, we find, combined with these disastrous effects upon the body, equally deplorable results to the mind.

The ability to acquire knowledge, and the power to retain that which has been so laboriously mastered, is materially lessened. These facts have been so repeatedly verified by educators in all branches of learning, and in every grade of school, from the primary to the university, that no one who has candidly examined the records presumes to doubt their validity or accuracy.

In addition to this, it has often been observed that youths who, before the habit of smoking was contracted, were courageous, resolute, manly and vigorous in mental fiber, became, after free indulgence in this practice, timid, fearful, hesitating and irresolute. The mental stamina was gone, and the quality of manhood produced much inferior to that originally promised.

One other effect, already alluded to by Mr. Higginbottom, deserves mention in this connection, viz., the dryness of the mouth and throat. and the corresponding thirst produced by smoking. This thirst is morbid and not to be satisfied easily with that which allays natural thirst. It craves something stronger. Also the nervous depression induced by the overuse of tobacco finds a ready and temporary relief in the stimulation of beer, wine and stronger alcoholics. These two causes, then, the thirst and the depression, are powerful temptations to drinking.

An an illustration of its influence in the matter of sports, the following may be quoted: "The late E. W. Yerrington, the champion wing-shot of Connecticut, attributed most of his skill to the fact that he never used liquor or tobacco in any form. 'He was,' says *The Hartford Times*, 'a pleasant, courteous gentleman, and one who did not resort to any trickery, nor did he know what getting 'shaky' meant, no matter who or how many spectators there were around him, or however exciting the contest might be to others. He weighed 265 pounds, was six feet and one inch in height, and had dark eyes. He shot an L. C. Smith double ten-gauge gun, thirty-inch barrels, and loaded his own shells by hand. He always used the same load at all kinds of targets.' There was no doubt that Mr. Yerrington could shoot 300 or 500 targets in succession with as little fatigue and make scores fully equal to any shooter in the United States." (*Tribune, May 5th, 1890.*)

This being the debit side of the account with tobacco for the young, what is to be put to its credit? I have no desire to be unfair, and no intention to misrepresent the facts as I have been able to gather them from the testimony both of those who use and of those who denounce the so-called "fragrant herb." There are three principal effects, then, which, in my judgment, embody the virtues of this article. First, one of gentle stimulation. This is seen in some persons in the increased flow of saliva, gastric juice and intestinal secretions, and in a temporary increase of the action of the heart, making the pulse fuller and stronger for a short time. This increased flow of blood to the brain quickens the train of thought, promotes social feeling and good-fellowship, enlivens conversation, and throws about the affairs of life a more roseate hue than the stern facts of existence justify and sustain. The second effect is one of a mild sedative character, and, in most cases, may be regarded as secondary to, and a consequence of, the first or primary action of stimulation. It is this which gives the chief value of smoking to most men. The worry and strain of business, the vexations, the exhausting weariness from overwork and too intense application find their solace in the cigar or pipe when the day is done. If it has been a day of success, the exhilaration is toned down; if one of reverses and misfortunes, the wretchedness is mitigated; if the work has been simply hard, the fatigued muscles and the tired brain are soothed and quieted and sleep promoted. These are the most favorable and beneficial results which are produced by the use of tobacco to persons in ordinary life. A third effect may be mentioned as of value in some cases, which may be regarded as a modification, perhaps, of the second. It is that of the so-called prevention of the waste of tissue, so that the demand for food and the amount consumed are less. It is this which comforts soldiers on long marches or while conducting exhausting labors in trenches or fortifications; cheers sailors in the wet and cold of long night watches or while subject to tremendous physical strain; and in both cases, by benumbing the nerves of the stomach and brain, both takes away the intense craving for food and lessens the pangs of the hunger already present.

Of these three effects, which are claimed as of value to men in adult life, but which are of so questionable a nature that it would be easy from the testimony of smokers alone to prove their ultimate worthlessness for the majority of mankind, none are to be regarded as indispensable, or necessary, or wise, or expedient, or helpful to young men.

1. Do the young need the stimulation of the cigarette to enable them to do their work in our day? Centuries before tobacco was known to civilization, the wise man of Israel said: "The glory of young men is their strength;" and centuries later another (the saintly John) said: "I have written unto you, young men, because ye are strong." Shall it be said of this generation the glory of our young men is found in their white hands, pale faces, trembling legs, feeble arms, weak hearts, and, above all, their beautiful meerschaums and elegant cigarettes? How have the mighty fallen! For stimulation to mental work and a capacity for it, we know a half-hour a day in the gymnasium under wise direction, or an hour of brisk and vigorous outdoor exercise, superior to all the tobacco ever produced.

2. Do young men need a sedative after a day's hard work? Not if they work legitimately and have been properly strengthened for it by wise development of powers of body and mind. The only sedatives that are safe, efficient and permanent are, rest and sleep.

3. In these days of abundance of food it were the height of folly to take into the system that which either retards or arrests those changes which the healthy body ought to undergo in transforming food into new tissue or into living force and casting out the worn-out material as useless refuse. It is safe to say, then, that tobacco has detracted essentially from the world's stock of force, physical and intellectual,

and it would be hard to mention any particular in which it has contributed to the advancement of the human race in greatness or virtue.

If we read aright the indications of natural law, this herb belongs to the category of poisonous drugs, and is in no sense a proper food or luxury for the young.

Believing that the ill effects of the tobacco habit on the boys of our public schools have neither been adequately investigated nor described, the New Jersey State Board of Health has instructed me to prosecute an inquiry into the subject. We have prepared, therefore, some questions directed to an examination into the influence of this habit upon the physical, intellectual and moral natures of pupils in our public schools. We bespeak for this inquiry earnest sympathy and hearty co-operation, in the hope that when the evidence is gathered, tabulated and published, it will supply us with such testimony as will prove of value in enforcing the lessons of a wise hygiene which looks to the noblest development of all the faculties of the immortal beings intrusted to our care.

THOUGHTS FOR SANITARY WORKERS.

BY EZRA M. HUNT, M.D.

I. THE CAUSES OR ORIGIN OF DISEASE.

In the study of all natural phenomena, or of their results, an inquiry into cause or the causes is always in order. There are various reasons for this. It is the pleasure of broad minds to trace things to their origin. In this joy is a part of their strength.

It is a pleasure, too, to be recognized as an original investigator. There is an almost invidious contrast made between those who combine, develop and spread abroad truth and those who first announce it. The one is original, a discoverer, the other subsidiary. It is forgotten that he who develops and applies may be more wonderful than he who discovers.

There is, beside this, something highly practical in the study of cause, or origin. It is often a grand and sometimes an essential step toward the attainment of results. When we know the cause of a thing, we are often in the best position to cause it to happen, or to prevent it. Yet here again we need caution. Immense things can be done, both inventive and conservative, when there is total ignorance of cause. If I find that quinine is the specific for malaria, and how the influence of malaria can be prevented or overcome, I am a far more important factor in a community, in an ague district, than if I expended the most of my time in studying the cause of malaria or the *modus operandi* of quinine. It is for this reason that on this topic there are two divergent schools of thought, although it must be confessed that original research and investigation have so much more of credit and applause that the other school is quite obscured. Yet, it now and then obtains a hearing, and is as irreverent as Cowper in his couplet: "Thóu fool! will thy discovery of the cause suspend the effect or heal it?"

"It was one of the chief merits of Comte as a thinker that he clearly perceived that science could only explain processes and transitions, and was unable to grapple with the question of causes. Hence, quite consistently, he ruled out all inquiries into causes as unscientific." Sanitation has to do not so much with maxims and formulas as conditions.

Prof. Semmolá, of Naples, in his address at the International Congress, Washington (1887), reviewed with severity the whole field of causation, as approached through the reigning biology. He says: "Medicine, like all other sciences, never demands why, knowing that the first causes of things are inaccessible, and that to every scientist it should suffice to know in what physical and chemical condition this or that phenomenon manifests itself, so that he can modify or govern it at his will. It is the primary work of science; and, for various reasons, especially so of medicine, to deal with and explain methods, processes and transitions. The question of origin is secondary."

Prof. Elisha Bartlett, in his "Philosophy of Medical Science," shows that medicine tends to be more vaguely experimental than most sciences, so that the term empirical is, in a sense, properly applied to it. It is only by the close observations of individual practitioners, repeated over and over again, and these multiplied by similar testimonies of scores of others, that through numerical data and collective investigation, we get the classified knowledge which constitutes science. Even before we reach this, we often get the applied art of the successful practitioner, both in hygiene and medicine.

Only with these brief reflections, it is evident that the word "cause" has different meanings in mental and moral and physical science; that in dealing with nature and physical laws it again has subdivisions. Most of all, as disease is a pathological state, and its prevention deals with unnatural conditions, the definition of cause has new complications. Although used so glibly and so promiscuously, no wonder it has been called a troublesome word. A learned professor of physics once said to me, "I hate it." It is a word abounding in misuses. It is used in different senses by different writers, and often by the same writer. Ever since the four-fold division of causes made by Aristotle (material, formal, efficient, final), the logicians have varied the definitions or explanations of them, or added to them. The dialecticians enumerate five causes. We speak of efficient and instrumental and final causes; of primary and secondary; of predisposing, determining and ultimate, or of predisposing, exciting and proximate causes. We now have the term "causa causans" (Woodhead, &c.), used as expressing the "causing cause," or the culminating factor.

Dr. Baker, in his address as President of the American Public Health Association, 1890, would divide the causes of disease into "specific, controlling and predisposing." We might speak of those that relate to the entity as *specific*, be it germ or product of germ or gas, &c.; of the *controlling or determining* as that which secures the sedation and action of the specific cause (such as atmosphere, or environment in general); or of the *predisposing* cause as relating to the individual, his general condition, or that of some particular organ.

At any rate, we would emphasize the facts that the finding of a cause is not always the primary idea in dealing with a disease, and that the use of the term "cause" needs searching inquiry as to the sense in which it is used, so as to guard against too great concentration upon origins and a too specious and indefinite use of the word. The causes of disease must be sought out as *among* the factors, and as liable to come into use at any time for clinical purposes. Yet, often a close study of symptomatology, of environment, of the incidents of disease, of the patient himself, and of hygiene and therapeutics, is far more important than anything else.

While there are many scientific etiologists who will deny that these are given a secondary place, it is nevertheless true.

Attention needs to be very largely turned to the laws of evidence and how they apply in the prevention and treatment of disease. Is there any causation in this case which has a bearing on remedial measures? is always one of the questions to be thought of, but there are so many others besides, that in practical, sanitary or clinical administration, it often takes a very secondary place. In the advance of these arts the great needs are such accurate and recorded observation, and such a number of these, on the part of each individual, as will make his observations entitled to the name of experience, and then that there be such a similar accumulation on the part of other competent observers as will aggregate the various experiences into a body of doctrine and of practice. This is very much more difficult than what is usually called original work, but nevertheless has in it the one great element of testimony or evidence derived from various sources by competent observers in a form which has direct practical bearing on the prevention of disease, as well as upon its treatment.

The following extract from an address of Sir Jame Paget will still further illustrate the importance of our urgency on this whole subject:

"Medicine and surgery are eminently a science of observation; deductions from facts are always unsafe; I believe that they have done far more harm than good; and, for the most part, when sufficient facts have been collected and arranged, the general conclusions that may justly be drawn from them are nearly manifest. The main thing for progress and for self-improvement is accurate observation. Some seem to think it easy to observe accurately—they cannot doubt, as they say, the evidence of their senses There are few greater fallacies. In scientific studies the evidence of the senses needs as much cross-examination as any evidence given in a criminal trial. Self-cross-examination it may be, but it must be steady and severe. For by accurate observation we must mean not the mere exercise of the senses, not the mere seeing, or hearing, or touching of a thing, with some *levity* of thinking about it—we must not mean even the keenest use of the eye cultivated in microscopic work, or of the ear hearing sounds that to the uneducated sense would be inaudible, or the use of the finger with the most refined detective touch. All these higher powers of the senses you must acquire by careful study and practice, and you must learn to exercise them with all the attention with which a strong will can direct and watch them; but even all this, difficult as it is, is only a part of *scientific* observation. This must include, besides, an habitual, constant watchfulness, the taking notice of all the conditions in which objects or events are found; their occurrence, their sequences, their seeming mutual relations, all their variations. To do this, and to do it again and again, and with constant care, whether it be in things occurring naturally or in experiments—to do this accurately and always is really very difficult.

"I wish that the arguments for this were only in the oversights, the mere defects of observation. Unhappily, the errors illustrated in all the history of medicine, and in much that is still in progress, are very numerous, too. Facts, when not quite overlooked, are too often seen and recorded erroneously. I would not speak of such errors without a confession of having contributed to them, or without the fair motive of wishing to urge the best means for avoiding the like of them. For remember that many of them were made, or are being made, by men as honest as we are, or ought to be, and fairly in the pursuit of knowledge. * * *

"It would need some volumes to relate all the sources of error in scientific observation. I will mention only one, for I think it is the most frequent, and I should like you to be always watching against it. It is the habit that we have of inserting some of our own, something of our beliefs, of our expectations, nay, even of our wishes, into that which we think or say that we observe. We expect facts or events to agree with what we believe that we know, and we make light of the differences and exaggerate the likenesses; we take no thought of what we call accidental exceptions; we think them unmeaning—as if anything in Nature could be without meaning—and we do not half observe them. In philosophy we can separate things from thoughts, the object from the subject; but in ourselves and in ordinary life they are mingled in every act of consciousness and reflection; and sometimes it is only by careful self-analysis and by habit studiously gained that we can separate them and observe simply and accurately."—*British Medical Journal, 1887.*

II. DIVERSITIES OF CAUSATION IN DISEASE.

In our modern searches for the origins of disease there is evident a strong tendency to seek for some all-prevalent cause rather than to multiply causes.

In science it seemed to simplify things much when we were able to speak of the correlation and conservation of forces, and to regard light, heat and perhaps electricity as forms or modes of motion. In a similar way the germ theory of disease strikes many minds as unifying the whole field of medical discovery, so that, as Prof. Semmolá expresses it, some seem to think that micro-organisms embrace all pathology. But we do well to remember that causation, as it relates to disease, is far more likely to be general than if it related to nature in its healthful condition. Some diseases are, in their inception, purely mechanical and to be regarded as accidents as much as some cases depending upon external violence. There are others that simply result from the wearing out of machinery and give us the results of friction, of wear and tear, of decay as much as does an old mill, or any other form of machinery long in use. Then again, as this human machine is self-reparative and to a degree self-feeding, we have wonderful laws as to derangement of function, which are wholly apart from the invasion of any disturbing force from without. Hence, those who furnish the most condensed nomenclature are compelled to speak of constitutional diseases, developmental diseases and accidental diseases, as well as of those that are dietetic or parasitic.

Here again each disease is to be studied in the light of its phenomena, and almost assumed to be individual and special until proven otherwise. Even where we are able to group diseases into families, classes, orders, genera, species, the species may have very little in common with the family to which it belongs.

There are two things against which modern hygiene and practical medicine have a special need to guard. The first is expressed thus by Prof. Hutchinson, of London: "All must unite in regretting the cramping influence of the application of single names, with a supposed but usually very arbitrary definiteness of meaning, to affections which do not acknowledge single causes and are in their nature ill-defined." We are in great danger of attempting to systematize too much, of endeavoring to describe and classify diseases as if they were similar in their degrees and kinds of relationship to the members of our fauna and flora.

The second is that which is formulated by the Duke of Argyle in an article in the *Nineteenth Century* of April, 1891, and forcibly quoted with special reference to medical progress by Sir Joseph Fayrer at the International Congress of Hygiene, August, 1891. It is this: "We should be awake to the retarding effect of a superstitious dependence on the authority of a great man and to the constant liability of even the greatest observers to found fallacious generalizations on a few selected facts."

Whatever credence we may give to biological facts and to the splendid record made by some of its observers, we are more and more finding out that there are diseases in which chemical actions and reactions, combinations and accelerated or retarded metabolisms have much to do, and although micro-organisms may be the occasion of the changes, it is somewhat questionable how far they are the proximate, the predisposing or the exciting cause.

It is this view of the complexity of causation that led Jonathan Hutchinson, F.R.S , F.R.C.S., to take as the subject of his Hunterian address, October, 1891, "The Laws of Partnership in Disease." The whole lecture needs to be read in order to get a full idea of how well he presents the relation of many causes rather than of one cause to most diseases. His application of it to the bacillary theories of the day will perhaps serve to illustrate how well it behooves us to study complexity of causation as well as individuality of causation:

> "The problem as to the kind of partnership which exists when bacilli are found in association with local inflammatory mischief is perhaps the most important of the day. By many it is believed to have been set at rest by the supposition that the bacillus is itself the sole cause of the malady. That I may not be needlessly prolix on a topic which is almost endless in its detail, I will take tuberculosis only as our example, and will at once avow my belief that so far from its being true that all the diseases and conditions formerly known as scrofula are due simply to the infection of a bacillus, we must still regard them, as our forefathers did, as being the result of a complicated partnership. One of the partners, and probably a very active one, in certain forms of this great group of maladies, is the bacillus. When it is present it at once stamps the disease with peculiarity, and if it does not originate its infective properties it greatly increases them. To it probably the special phenomena of tuberculosis in the restricted sense of that word are due. Bacillary tuberculosis may, however, I

would venture to suggest, still be held to be only an epiphenomenon of scrofulosis. The partnership in the latter is probably very complex. It is shared by the results of hereditary transmission, by the diet employed in early life, and by a great variety of influences tending to degrade the vital stamina. As a joint result of the sum of these, the patient's tissues have assumed a condition of defective vigor and become prone under slight provocation to take on chronic inflammation. Congestions very readily ensue and are with difficulty got rid of. 'Bad flesh to heal' was the old definition of the scrofulous state. Is it not so still, and is it not a reality, a thing which we encounter every day, and which does not depend in the least on the actual presence of the tubercle bacillus?

"May it not be suggested with great plausibility that the state of the tissues to which I have referred offers the soil in which the bacillus flourishes? The best illustrations which I could give of this partnership which I would suggest exists between scrofulosis and tubercle may be found in that family of diseases which we know as lupus. Those who hold that tuberculosis and scrofula are one and the same thing, and that they are caused by, and not in any way productive of, the bacillus, are very anxious to assert that what they call 'lupus vulgaris' is alone true lupus, and that a large group of other maladies closely similar to it, and offering connecting links in all directions, have in reality no relationship whatever with it. Their desire in this matter is prompted by the fact that the tubercle bacillus may, in some cases of what is called 'common lupus,' be proved to be present. It is rarely so in large numbers, and in a majority of cases it is not to be found. These facts, however, are held to be of little importance, and the disease is confidently placed in the bacillary group. My theory of lupus, in all its various forms, is rather that it is essentially a form of chronic inflammation, closely allied in the majority of cases with what we know as the scrofulous diathesis, and only exceptionally becoming the nidus for bacillary development. This theory appears to me attractive, because it supplies explanation of the varieties of form which lupus-disease assumes, and enables us to recognize that very various influences may take a share in its production. All forms of lupus are partnerships. In all probability, something closely allied to scrofula and hereditarily-transmitted feebleness of cell vitality is the senior partner in the firm. With it may be combined other peculiarities of congenital organization. An abnormal susceptibility to vascular disturbance, with proneness to the kind of congestion which we call chilblains, will cause the lupus to take the type of erythematosus, and so on of the other varieties. Those who insist that the cause of lupus is simple and single are compelled, as I have said, to detach certain forms of the disease from others which are equally characteristic, and to leave a large group of maladies without even an attempt at their explanation."

Professor Hutchinson throughout his address insists upon more heed being given to this complexity of causation, since there are many morbid conditions in which it is impossible to single out any one cause as taking unquestionable precedence of all the rest while there is an intermixture of causal influences closely related to each other.

III. THE PREVENTION OF EPIDEMICS.

As to the prevention of epidemics we suggest a few of the leading directions in which investigation and observation are most needed:

"1. What is the *contagium vivum?* As to this we have to determine in what its entity consists; whether it be particulate or gaseous, whether it be so specific and singular in its character that it is always the same as to quantity or quality; or, if capable of modification, how it can be modified; whether it be always derived, or whether it be produced so as to be in a sense spontaneous. In a word, we must study the contagium so as to know the most possible about it in its own individuality.

"It is almost unnecessary to say that the germ theory of disease has immensely broadened this part of our study; but perhaps it is needful to say that the fact that we are nearer than ever before to the identification of certain or most contagia, does not clear up the question as to whether they are derived or spontaneous, or how the benign bacillus becomes malign. It does not settle their origin, and so does not, by original dealing with the entity, assure us how we can prevent its existence, and so radically prevent epidemics.

"Most contagia thus far seem identified with plant life. We may get lessons as to modes of study from the fact that many communicable diseases seem to have to do with plant life.

"It is not surprising that Hallier, Panum, De Bary, Cohn, Thome, Darwin and others who were early in these studies, were botanists, and it has seemed to me that we would have done well, in our study and classification of this infinitesimal life, to have followed still more closely in their methods. The botany and zoology of microscopic parasitic life will doubtless have yet a classification well nigh as extended as that which belongs to life in its more visible forms.

"The worker in this field is in a garden of contending vegetations in which it is not enough to say that each spore or germ or seed will produce its kind. *Omne ovum ab ovo* is true enough in animal life, but this does not prove the impossibility of a mule, or of some other product, or of a disease equally unique in its way. It is a marvel to see how the same seed can be so cultured that its products may be greatly varied, and how marvelous are the hybrids or sports that may result. To me the views of Pasteur do not seem to conflict with those of Bastian, nor does the doctrine of a result in disease, so modified as to almost defy identification, or so crossed as to give a mongrel, or what practically as to treatment is new, at all lean to the doctrine of spontaneous generation as formerly taught. Cholera, typhoid fever, diphtheria, &c., may some day become existences amid intense disturbances of natural processes. Although now generally occurring from derived sources, this does not preclude the possibility of their occurrence locally and sporadically without an antecedent disease—the only antecedent being the same disturbance of natural processes. It is strange that nitric acid and glycerine—the one corrosive, the other emollient—should have been so long handled in the chemical laboratory before nitro-glycerine should have begun to exist. So, from special relationship of ordinary filth and extraordinary atmospheric conditions there probably have come, and probably will come, new diseases, the origin of which we do not define when we find a germ, however much it may aid us in diagnosis.

"2. Our next study, though allied, is quite distinct. Failing to find the seed or contagium, or to destroy it, how shall we make of its *vivum* a case of suspended animation? How shall we sterilize it? I will not here discuss its culture in order to enfeeble it, as this is going on well enough. But I allude to the study of how we may provide it a sterile soil, either in the surroundings or in the person. This involves a close study of each contagium, and on what it flourishes best, within and without.

"While the name filth-disease is a convenient generalization, we are not exact in our study until we accurately define decompositions, putrefactions, associated animal or plant life, so as not only to affirm, for instance, that vegetable decay causes periodic fevers, and animal excretion typhoid fever, but also to carry the details of observation of facts and of experiment to an extent which shall enable us to approach the exactness of the botanist, who says the silk-worm thrives best on mulberry, and that the potato bug has an especial relish for the egg-plant. For the prevention of epidemics there is this special field of study as to all the minute conditions or surroundings outside the body. We shall have gained very much when these scientific or expert methods, which are applied by the skillful naturalist, for instance, to all harmful or poisonous plants or insects, are applied to all embarrassments to our lives productive of disease as found outside and about us.

"While the first plan, that of discovering a germ, is radical, yet it is not necessarily indispensable, if we can so apprehend the necessary conditions for propagation as to circumvent these. Hence, students of this second class are not to be discomfited, even if the first study be incomplete.

"3. The study of the individual in his relation to the *contagium vivum*, and to his surroundings, is another distinct study, inviting to another class of skilled observers—a laboratory in which minute work is much needed.

"1. Under what circumstances does a human being come to be the host of something inimical to him, and prepared for an invasion of something producing disease? It is not enough to say of it that it is its nature to seek or to be communicated to human beings, and to develop into a disease. The fact that some persons, without having had a disease, are proof against its invasion, is a significant one and worthy of great attention by those who would like to put all in the same restful condition. The fact that once having had a disease protects most from it afterwards, or does not protect some, or, while protecting all, does not protect all for an equal period, cannot but make the epidemiologist very inquisitive to find out the reason, and so put it into effective preventive operation. Watson and others have stated that it is because the disease exhausts its necessary pabulum in the system; but if this be so, the statement is incomplete until we find out what pabulum it has wasted and what it has exhausted. As in the old system of inoculation it was discovered that by diet, or by certain preparative treatment, small-pox could be modified in virulency, and the secondary fever aborted, the why and the wherefore should not be given up by the modern medical profession, as it apparently had to be in the former.

"2. When, too, we find that, as in inoculation to prevent pleuo-pneumonia in cattle, we secure an inflammatory reaction, and a constitutional effect through a muscle, and so prevent the fatal attack on a vital organ like the lung by a sort of artificial metastasis, we need to study how much of diversion and limitation of epidemics can be secured by their artificial and preliminary introduction into some part other than that which it seems their habit to attack with virulence. How much of the modified effect is owing to the mode of introduction rather than to attenuation?

"3. Still further, if we know that changes can be so wrought in systems as to make them unreceptive of diseases, as we know to be the fact with many ailments, cannot and do not quinine, alcohol, potassium chloride, ferric chloride and other antimicrophytes, antizootics, or antiseptics cause the blood and tissues to be protected from the invasion while there is exposure thereto, and so may we not prevent epidemics?

"We know by actual experiments and observation that we can see the blood corpuscles multiplying during the administration of iron, and can, with small doses of quinine, potassium chloride, arsenic, &c., have the sustained presence of these in the blood. There is good reason for thinking that during such presence the blood and tissues become resistant to that multiplying plant life which either directly, or by its overpowering abundance, or by mechanical clogging of blood-paths, constitute the gravity of the disease; also, that we can anticipate the action of the introduced contagium and make the system refuse to nourish or propagate the parasite. Thus, either all may escape the prevailing influence, or so many that it cannot prevail among the people, and so cannot become epidemic. This temporary prophylaxis during what, for want of a better term, has sometimes been called an epidemic tendency or constitution of the atmosphere, is most worthy of accurate study. As to its reality, many corroborative facts from Polli, Parkes, Panum, Burt, &c., can be adduced.

"Then, last of all, comes the question of the limitation of diseases in their attempt to become epidemics, and after they have so become, the former being most valuable forethought, the latter being not unimportant afterthought. This limitation involves the study of the natural history of every communicable disease in all its minutiæ, that we may know its times and seasons, the distance at which it can be propagated, the length of the period of its communicability, the secretions or families most likely to convey it, the relation of breath and of air to it, and all other facts which are relative to its transmissibility; and, as a sequel, comes in the study of isolation and of disinfection, &c., as a system of rules and regulations.

"Our imperfect knowledge does not hinder us from general rules and methods founded on apparently correct generalizations as to all communicable diseases, and specifications as to some, so far as we know.

"The most inspiring result of what we may call the modern departure in epidemiology is not so much the conclusiveness or completeness of facts in any one direction as the unmistakable indications of precision in the laws of communicable diseases, these being as accurate as those that obtain in nature, giving us the comfortable persuasion that they are ascertainable and classifiable, although, for various reasons, difficult of ascertainment, but likely to yield to analytic and statistical methods, and to that tact of experience in observation which can be acquired but cannot be described.

"The chief contentions of this paper are, therefore, as follows:

"1. In the study of the *contagium vivum* we are to recognize not only change from culture or attenuation, but, as in plant life and animal life, to recognize manifold changes which may take place, so discursive as to obscure identity, and so as to make what in pathology and treatment may be a new disease, without involving the doctrine of spontaneous generation.

"2. We must give significance to the effect of imparting a disease to the system by channels or modes of introduction different from what may be called its normal method of entrance, and allow for modification of effect from this cause without any real attenuation.

"3. We must study closely not only the general effects of surroundings, but the fertilization or rankness which some diseases attain from a compost especially adapted to them.

"4. We need, with the same precision and in a similar direction, to ascertain what are the conditions of individuals who furnish in themselves extraordinary soil for communicable disease, or who withstand seizure amid exposure, or have but a mild attack, and to recognize that there are ascertainable reasons for this difference, a definite law of susceptibility.

"5. We need to give great prominence to a study of direct prophylactic methods, and such as shall seek, during exposure or the prevalence of an epidemic, to prevent an attack by imparting to the blood and tissues the presence of such substances as shall prevent those changes which an introduced morbific agent would otherwise set up."

IV. MIXED NOMENCLATURE AS TO MODES OF MICROBIC LIFE.

We need a fuller understanding of terms as applied to the various forms of microbic life or to their life history. The general names, microbe or micro-organism, and the additional divisions of microphytic and microzooic as denoting vegetable and animal life, are sufficiently definite. So the various subdivisions that distinguish bacteria, bacilli, &c.

But our chief confusion is over terms that relate to the modes of microbic life and arises from their being used in different senses or with different limitations by different authors.

Some examples of confusions can be found in the sense in which the terms parasitic, saprophytic, obligate, facultative, &c., are used. Let us compare two or three descriptions:

"Germs," says Vaughan (Michigan State Medical Society, June 1890), "are divided according to the food on which they live, into the saprophytic and parasitic. The former thrive only upon dead matter, while the true or obligate parasite can exist only on living matter. The parasitic forms are generally considered the most deadly, but I doubt very much the truth of this supposition. The micro-organisms of syphilis and leprosy are good examples of true parasitics; the same is true of the gonococcus. None of these have so far been grown in artificial culture media. They refuse to grow save at the expense of some host. Their continued existence depends upon the continued life of their host, or on a transfer to another host. It is not in accordance with the well-being of the germ itself that it should speedily destroy its host.

"A germ growing in the intestine does not necessarily feed upon living tissue. The food before absorption is not possessed of vitality. The most deadly intestinal micro-organisms belong to the class of saprophytes. They prove harmful by elaborating chemical poisons which are absorbed and which produce the symptoms of the disease and death."

The description of Dr. Louis Parkes is as follows:

"The parasitic micro-organisms, on the other hand, prey on living matter alone, or *equally with dead*, splitting up the albumens into other organic bodies or bases. This power of attacking non-living matter, evidence of a certain degree of saprophytism, enabled us to cultivate many pathogenic organisms in artificial media, as peptone gelatine, milk, broth, serum and agar-agar, and by inoculating animals with the pure cultures to study their action on the living body. These, which included the microbes of tubercle, diphtheria, anthrax, erysipelas, tetanus, and many others, were called 'facultative' parasites, while those which were not hitherto known to develop out of the living body were termed 'obligate' parasites. To this class belonged the micro-organisms of small-pox, vaccinia, measles, whooping-cough, &c., and of them we necessarily knew but little. The division, moreover, was only provisional, since improved methods of culture might enable us to transfer some or even all of them to the facultative class. Another subdivision of the parasites had been proposed, viz., that into (1) toxic and (2) infective micro-organisms. The latter, including those of the exanthematous fevers, were found to pervade the blood and every organ of the body; the former, of which those of tetanus and diphtheria were typical examples, acted on the organism through the toxines or ptomaines which they produced. These chemical substances could be isolated, and, in a state of chemical purity, inoculated into an animal, gave rise, in the absence of the bacilli themselves, to all the phenomena of the disease. In the case of man, the bacillus of diphtheria was confined to the throat or seat of inoculation, though the phenomena of the disease, owing to the diffusion of the poison, were general. Closely corresponding with the division of parasitic micro-organisms into obligate and facultative was that of the respective diseases into epidemic and endemic on etiological considerations."

Dr. Candler (*Lancet*, December 27th, 1890) contends that the bacillus tuberculosis is an accidental and not a true parasite. This bacillus in its present form is a saprophyte (and facultative parasite in the animal organism), growing free in nature, and grows in, among other places, the dark or infrequently-lighted dormitories of man." Dr. Woodhead confines the term parasitic to those micro-organisms "which are able to flourish in or within the substance of plants or animals," and would substitute non-pathogenic for saprophytic, and drop entirely the terms "obligate" and "facultative."

> "Some of the organisms which, at present, are supposed to be saprophytic in character, may eventually be found to be parasitic under certain conditions, and it is for this reason that the term non-pathogenic is gradually ousting the older botanical term of saprophytic.
>
> "Parasitic bacteria are those which are able to flourish on or within the substance of plants or animals. In animals they live in the various cavities of the body, or in certain cases, in one or other of the nutrient fluids of the body, and they derive their food from these fluids, or from the nutrient materials which are taken in by the host. The ordinary terms of obligate parasites, facultative saprophytes, and facultative parasites, can scarcely be used in connection with these minute organisms, as, with very few exceptions, all the parasitic bacteria have now been cultivated outside the body and under such conditions that it is evident that some of those which were at one time looked upon as purely parasitic have a saprophytic stage of existence, so that nearly all, if not all, the parasitic bacteria must be looked upon as facultative parasites, or parasites that can develop almost as well saprophytically as they can parasitically, or facultative saprophytes, or saprophytes that can develop almost as well parasitically as they can saprophytically." (See Woodhead "On Bacteria and their Products," 1891, page 146.)

The true or obligate parasite can be no longer said to develop only in or on the living body, while the "facultative" parasites cannot be fully described as saprophytes, or those which subsist on dead animal or vegetable matter only.

The confusion arises because the lines of demarcation which these terms were once thought to describe are not accurate. We incline, with present knowledge which itself may change, to follow Woodhead (1891), and confine the term parasite to those micro-organisms "which are able to flourish on or within the substance of plants or animals," and to substitute non-pathogenic for saprophytic, and drop entirely the terms "obligate" and "facultative."

Thus, old terms and distinctions have to be set aside, not because originally obscure, but because new series and assemblages of facts supersede or modify former hypotheses.

Physical, chemical and biological hypotheses, as well as some others for which we yet have no name, will probably for long occupy the patient research of many investigators.

In the meantime the practitioner more than ever needs the study of processes, of the laws of waste and repair, of nutrition, of all pathology, of the action and effects of medicine, and so may go on succeeding in his practice and hoping for the coming time when a greater knowledge of origins may throw additional light on some diseases.

V. REMARKS AS TO THE ORIGINS OF DISEASE.

The "Germ Theory of Disease" has so powerfully taken possession both of the medical and popular mind, that some cautions and precautions are in place as to it.

While acknowledged to be the one prevalent medical doctrine of the age and to have in certain directions abundant facts for its support, we regard the following suggestions as important to be kept in mind:

1. The relation of micro-organisms to *causation* has been proven in only a few diseases. We need to guard against too great license of inference that they *must have* a primary causative relation to this or that disease.

2. Where there is evidence of minute animal or vegetable life as related to disease there are some such broad lines and distinctions of classification that we are not in our clinical study of them to associate them too closely. Treatment may be very different. How the animal parasites differ among themselves and in their effects and from all vegetable microbes the trichina and the itch insect will serve as illustrations. Then how diverse, the bacteria and bacilli, and how each, so far as known, have their own laws of growth and influence, these being different in different animals. How different still the whole class of protazoa, such as the malarial germ or microzoa (Laveron) of the Texas fever germ (Smith). These represent "the lowest group of the animal kingdom" (Koch) and so are microzooic instead of microphytic. Koch in his address at the International Medical Congress, Berlin, August, 1890, speaking of hydrophobia and its protective inoculation, says: "The cause of the disease is still unknown and it is probably not even of bacterial nature." The effect of *products* of animal or vegetable life as a cause of or associated with diseases and as distinct from the minute life, is ever to be borne in mind.

3. We are not to lose sight of the fact that at the most there is a

vast realm of disease outside of the domains of germ life. Dr. W. K. Sibley in a paper (Pathological Society of London, December 2d, 1890) on the non-contagiousness of cancer, after briefly referring to the so-called "cancer bacillus" of Scheuerlen, said that in his opinion secondary growths sometimes occurred, started by primary ones, not through any contagious property of the latter, but merely from the mechanical irritation these caused, and then quoted Mr. J. Hutchinson to the effect that cancer itself was not due to any special material introduced into the body from without, but was simply a modification of what occurred in chronic inflammation.

A disease may be particulate without being microbic.

There is still a devitalizing as well as a vitalizing *chemistry*, in which gases and decompositions and metabolic changes have to be studied as factors in disease quite outside of micro-organisms. We must not lose sight of the fact that psycho-chemical conditions cause many diseases.

4. We need to realize in what a tentative and formative and well nigh empirical condition all biology is, so far as related to etiology and the treatment of disease. We would call it chaotic if this did not convey too much the idea of hopelessness. It was not two years since (August, 1890) when Dr. Koch said, "it must be regarded now as fully established that the bacteria, as well as the higher vegetable forms, represent fixed species." True, at that time a respectable minority did not so think, but how the number has increased since! To Davaine, Naegeli, Pasteur, Buchner, &c., have been added Crookshank, Woodhead, J. Bland Sutton, Thorne, Parkes, Creighton, Vaughan, &c. This, although bringing about what is in effect a *de novo* origin of disease, does not involve at all the doctrine of spontaneous generation or heterogenisis (see Bastian, &c.), but only evolution and the repetition of what is abundantly seen in horticultural life as to hybrids or as to mongrels. Some forms are fixed, others having become so, are practically immovable, while as to others we have all the varying degrees from that which is evanescent to that which is persistent. The play of circumstances, incidents, accidents, cultivations, degradations, and of personality, both in the vegetable and lower and higher animal life, and of all environment, is vast, and will yet unravel amid minute and incessant biological and clinical industry.

When we get further in that field we may know more about the disappearance of the plague, the cessation and modification of the old leprosy, the rise of diphtheria, yellow fever, cholera, &c. We may come to understand better that Sydenham was not dumb when he could not diagnosticate measles and scarlet fever, or the Continental practitioners not ignorant when they knew no difference between typhus and enteric fever.

We owed much to the old botanists, but we have not kept pace with the revelations of modern botany as to specialization, sports, hybridism, fixity, variability and evolution.

Speaking recently of diphtheria, Dr. Woodhead (Epidemiological Society, February 18th, 1891) said: "The observations of Loffler, Roux and Yersin on the diphtheritic and pseudo-diphtheritic bacilli seem to throw light on the marked changes of type seen in the course of epidemics of that disease. It was probable that certain conditions and surroundings, among which might be the presence of some of the bacilli and their products, were necessary to evolve the malignant out of the comparatively harmless, and that these conditions might operate out of as well as in or on the living body."

Dr. Willoughby expressed the conviction that the modification of the functions of the micro-organisms effected by their surroundings, presented the only satisfactory and complete solution of the phenomena of epidemics of diphtheria, the progressive virulence of successive cases and the concurrent prevalence of sore throats of every degree of severity, which had long been the puzzle of clinicians and pathologists, as well as those of the recurrence and recrudescence of the disease."

Dr. Thorne Thorne, in his recent work on diphtheria, in discussing the sore throats which precede or are prevalent with diphtheria, discusses "the possibility of progressive development of the property of infectiveness."

So Dr. Vaughan and others as to the changes of the bacterium coli communis and other organisms.

All these show in what an unstable equilibrium all microbic biology is and how, too, we may yet find changes, interchanges, evolutions and revolutions that will retire old diseases, or greatly modify them, introduce new diseases, initiate and conduct variations and so call for the closest scanning. Truth is often an army which has a very moving tent and is not always one day's journey nearer home. The real truth is that we have to deal with many causes, not one, and there is still a wide area over which to arrange the forces we call causes and to assign to each its sequence and its influence. But there is progress, and there are many practical lessons by the way. We are already aided as to some diseases. Only let us not convert all medical science into one microbic creed, and attempt to make life and disease and death all fit into this one procrustean bed. "Because," or by the cause, does not always mean one fact, but series of facts.

NEW JERSEY SANITARY ASSOCIATION.

Report, with Outline of Papers and Discussions.
Session of 1892.

BY DAVID C. ENGLISH, M.D.

The eighteenth annual meeting of the New Jersey Sanitary Association convened in Music Hall of the Laurel House, at Lakewood, N. J., at 4 o'clock P. M., Friday, December 9th, and closed its sessions on the afternoon of the next day.

The attendance was unusually large at the opening session, and the numbers increased considerably at each subsequent session until about twice the usual number in attendance was reported. Twenty new members were enrolled, and, with only two or three exceptions, the members remained until the final adjournment. We were glad to receive as delegates from the Board of Health of the city of Philadelphia, Dr. E. O. Shakespeare, Port Physician, and Dr. P. D. Keyser, and also Dr. W. B. Atkinson, Permanent Secretary of the American Medical Association, and Dr. Jos. F. Edwards, of the Pennsylvania State Board of Health.

The managers of the Laurel House treated us with remarkable liberality, and provided most bountifully and with sufficient variety for all of our needs.

FRIDAY, December 9th, 4 P. M.

The meeting was called to order by the President, E. L. B. Godfrey, M.D., of Camden.

W. J. Harrison, Esq., of Lakewood, made a brief address of welcome, which was responded to by the President. J. C. Smock, Ph.D., State Geologist, was then introduced and read an able paper on

THE CLIMATIC FEATURES OF THE HIGHLANDS OF NEW JERSEY,

Illustrating it with maps of the State issued by his department, and statistical tables from the Board of Health Reports.

(This paper will be found in the present State Health Report.)

Isaac Hull Platt, M.D., of Lakewood, was then introduced and read a paper on

THE CLIMATIC FEATURES OF THE PINES OF NEW JERSEY.

Dr. Platt referred to the health-giving qualities of pine regions as having been recognized as far back in history as the classic eras of Greece and Rome, whose physicians sent their patients suffering from pulmonary diseases to pine-forest regions. Pliny says: "It is a well-known fact that forests planted with trees from which pitch and resin are extracted are remarkably beneficial for patients suffering from phthisis, or who are unable to recover their strength after a long illness. Indeed, it is said that in such cases to breathe the air of localities thus planted is more beneficial even than to take a voyage to Egypt."

He refers to the fact that this form of treatment is to too great an extent empirical. The medical profession does not rest satisfied with the fact that certain classes of invalids grow better in such localities, but seeks its cause. Dr. Platt then discusses several theories which have been advanced to account for it. First, that of the friction of the air blowing against the sharp pine needles, producing an electrical condition of the atmosphere which tends to its purification. While this theory is not supported by experimental proof, it is well known that growing pine is rich in substances of an antiseptic nature and may serve to retard the development of disease germs. It is doubted, however, if a sufficient quantity of these substances can be taken up by the atmosphere, especially in winter, to exert an antiseptic action. A modification of this view, Dr. Platt thought, deserved consideration. Peroxide of hydrogen, one of the most powerful antiseptics, liberates nascent oxygen, which is nearly identical with ozone. It has been shown by Mr. C. T. Kingsett "that when turpentine is exposed to the action of air it absorbs oxygen and gives rise to the production of a peculiar organic peroxide, which remains dissolved in the body of the oil and communicates thereto properties resembling those of peroxide of hydrogen. Insomuch as the oil is volatile, these properties are communicated to the surrounding atmosphere." Dr. A. L. Loomis is quoted as believing that in this way if the bacteria are not destroyed the production of their poisonous products is prevented or retarded.

The peculiar nature of the soil upon which these evergreen forests grow was then considered. It was queried if there is not something in the nature of the soil which is inimical to the production of disease germs, not by producing any substance antagonistic to them, but by refusing to afford conditions favorable for their germination and development. The purest atmosphere is found at sea; seafaring people are remarkably free from consumption and the disease is incomparably rarer in navies than in armies. On the other hand, the dry air of the desert is also exceptionally pure, while the atmosphere of rich tropical jungles, with their rank vegetation and low, damp bayous, is notoriously productive of disease.

Dr. H. I. Bowditch's observations on the direct relation between soil dampness and the prevalence of consumption were dwelt upon, and Dr. Platt calls attention to the fact that it is not dampness, *per se*, which causes disease, but dampness under such conditions as to produce rank vegetation and the decomposition of organic matter.

Pines grow almost invariably in dry, sandy, sterile soil, at least in New Jersey, where the pine region may be roughly described as a tract of land about sixty miles in length and from eight to twenty miles in breadth, reaching from the neighborhood of Freehold to that of Vineland. South of Vineland there are pines, but there other features of the country change its character and render it less desirable from the standpoint of the sanitarian.

Speaking of the townships of Howell, Jackson, Manchester, Southampton, Woodland, Shamong, Winslow, Hammonton and Lakewood, the Doctor showed, for the six years—1883 to 1888, inclusive—the death-rate was 12.16 per thousand, while for the whole State it was 18.65; for the whole State, excluding cities and towns of over 5,000 population, it was 15.07 per thousand. The death-rate from consumption in this region was 1.60 per thousand; for the whole State, 2.53; the whole State, exclusive of cities and towns as aforesaid, 2.12.

These figures are the more striking when it is borne in mind that this represents the poorest portion of the State, where the unhygienic conditions consequent upon poverty are the greatest.

The soil of this region, according to Cook's "Geology of New Jersey," its composition, with but 6 per cent. of water, its sterility, sparse vegetation, little moisture, rapid drainage, because of its porosity, were dwelt upon by the writer, who then proceeds to speak of meteorological observations, which have been taken at Lakewood, which show a markedly lower relative humidity than that of New York City. Dr. Platt, while always opposed to making extravagant claims for this region, felt at least justified in saying that it had such negative conditions as tend to render the air aseptic, by the absence of soil moisture and soil putrefaction and by such positive antiseptic action as the air of pine forests is able to afford. It is free from malaria, and, having a comparatively dry and pure atmosphere, is indicated in pulmonary and bronchial diseases and catarrhal conditions of the air passages in general. It seems also of value in cases of chronic rheumatism and in some forms of Bright's disease.

HEALTHFULNESS OF HEALTH RESORTS.

Henry Mitchell, M.D., of Asbury Park, was then introduced, and read a paper on "Healthfulness of Health Resorts," from which we give the following points:

Change of climate is, in recent years, almost invariably made subject to the advice of a physician. Not so in former years, because the public were not acquainted with the value of change of dwelling-place in the treatment of disease, and because their resources did not admit of the free expenditure of money which the practice of the art of hygiene often involves. The relation of physician to patient has gradually been extended until it now affects details of daily life, while formerly the patient was always an invalid and the physician was employed solely to prescribe remedies. There is a class of patients, whose numbers are rapidly increasing, who apply to their physicians for advice in nearly all matters which concern health without waiting until disease appears and death threatens. The patient is advised concerning air, water, food, clothing, habits, exercise, pastimes, occupation and dwelling-place. Inherited or acquired defect or weakness is studied and tendency toward disease is treated.

Dr. Mitchell said he desired to present one point only in connection with these new relations between physician and patient, viz., some considerations in the selection of climate. He regretted that it had been so difficult to obtain records which clearly and fully represent the conditions which constitute climate and to reach a satisfactory conclusion in reference to the influences which a given place will exert upon a given case, because of meagerness and carelessness in voluntary observation of meteorological phenomena; false deductions and designing misrepresentation.

The physician may select a locality which seems to be appropriate to a patient's needs so far as altitude, temperature, sunshine, humidity and certain other natural features of climate are concerned, yet he rarely has information relating to the sanitary status of the town and dwelling to which it is proposed to send the patient. Nature may have provided pure air, pure water and clean soil, but artificial causes may have poisoned the air, water and soil, and transformed a healthful situation into a plague-spot. Shall the physician ignore these pollutions? Clusters of hotels and boarding-houses exist in nearly every place which has distinguishing characteristics of climate. Often each such establishment has its leaching cesspools and privy-vaults; its leaking drain-pipes; its wet and musty cellar; its well which has free communication with the polluted soil. The blindness of those who will not see affects the class of men who manage these establishments. A policy of secrecy governs their dealings with the public concerning the disposal of waste fluids and all similar operations affecting health. A mysterious network of pipes and fixtures, a fine display of bath-tubs, wash-bowls and water-closets seem to satisfy the popular demand for modern conveniences. The source of the water-supply or the disposal of the sewage occasions little concern. The most highly-decorated plumbing fixtures *may* be furnished with polluted water, and they may discharge into waste-pipes which pour out sewer-gas into halls and sleeping-rooms.

Glittering metal and gilded porcelain can be presented to the confiding patron as conclusive evidence that all the sanitary features of the house are excellent; and ninety-nine per cent. of the traveling public can be thus completely hoodwinked, and dissuaded from investigation.

Dr. Mitchell then calls attention to the fact that frequent outbreaks of typhoid fever in farm-houses and in other isolated dwellings and in small villages have demonstrated that greater safety can be afforded in towns which are populous enough to be thoroughly organized and equipped with a public water-supply, sewers and a sanitary police. For widely-separated dwellings the proportionate cost to provide good drainage and a safe water-supply is far greater than for town houses, and as there is rarely any efficient, authoritative sanitary supervision in rural territory, the chances become small that proper protection will be exercised over the health of the inmates of hotels and boarding-houses thus located.

The doctor argues that therefore every place for which it is proposed to obtain the patronage of medical men should furnish the physician, upon request, a statement by a health officer or other responsible authority, showing exactly what the local sanitary conditions are; and generalities should not be accepted. The statement should include the following subjects: (1) Vital statistics, (2) water-supply, (3) sewerage, (4) scavenging, (5) nuisances and (6) habitations. We should know the population, together with the total number of deaths; the number dying at different ages, the causes of death, and particularly the number dying from preventable diseases. Dr. Mitchell refers to the importance of securing mortality records of health resorts that are not deceptive, and adds that when these records are carefully made, so that not only the name of the decedent and the cause of death shall be stated, but also, in the case of non-residents, the former dwelling-place and the date of arrival in the place in which death occurs, then correct comparisons can be made with other localities which do not possess a large transient population of infirm and sickly visitors. The water-supply of a health resort should be pure and abundant, if the place is to have the countenance and support of physicians. Certainly no locality should be recommended where surface wells near dwellings are known to furnish the drinking-water.

The disposal of waste fluids is the most serious problem in sanitation with which many health resorts are confronted, and because of great cost of providing good sewerage we often find makeshift methods resorted to in such localities.

Localities which will in future succeed in winning professional approval as health resorts will not only maintain the natural purity of air, soil and water, but they will also be free from all preventable conditions which offend the senses.

We append the doctor's restatement as containing in small compass valuable suggestions which physicians, in giving advice on the subject, and proprietors of hotels and boarding-houses at health resorts desiring the approval of medical men and the patronage of the public, would do well to bear in mind.

1. Physicians control the patronage of health resorts.
2. No health resort is entitled to confidence which does not maintain good sanitary conditions on all premises where visitors are received.
3. Every health resort should furnish to physicians, upon request, a full and clear statement of facts, based upon recent inspections and correct records, relating to the provisions which have been made for the protection of the public health, and showing the conditions affecting health which exist on any specified premises within the district.

Dr. W. C. Stone, of Lakewood, said he thoroughly indorsed all the statements in Dr. Platt's paper concerning Lakewood, and gave an interesting account of his first visit in October, 1886, when he visited it in search of health. Lakewood restored his health and he has since spent his winters there.

Dr. W. H. Hall, of Lakewood, also indorsed Dr. Platt's paper, and while he thought Lakewood's claims had been very modestly set forth, he thought enough had been said.

Prof. A. R. Leeds, of Hoboken, had been greatly interested in the excellent papers presented. He thought the questions under discussion were largely ones of climatology and physics. He spoke briefly of atmospheric organisms, barometric pressures, temperatures, the direction, velocity and volume of winds, humidity, &c., as entering largely into the question of the healthfulness of localities, and emphasized the importance of correct meteorological observations.

Dr. Dowling Benjamin, of Camden, also spoke briefly. He had been much pleased, not only with the paper, but also with the remarks of Professor Leeds, and spoke of the great importance of biological examinations of germs in the atmosphere, water, &c.

EVENING SESSION, 7:45 o'clock.

The meeting was called to order by First Vice President Carrol Phillips Basset, C.E., of Newark, who presided over the evening session.

Rev. C. H. McClellan, pastor of the Presbyterian Church, Lakewood, was introduced, and opened the session with prayer.

He was, on motion, invited to sit as a corresponding member.

THE PROGRESS OF SANITATION IN NEW JERSEY.

President E. L. B. Godfrey, M.D., of Camden, then delivered a valuable address on "The Progress of Sanitation in New Jersey." (See page 45, of this Board of Health Report.)

PHYSICAL CULTURE.

Capt. T. D. Landon, commandant of the Bordentown Military Institute, was introduced, and presented a paper on "Physical Culture."

All sanitation is a species of warfare. Among the principles of warfare is the idea of keeping the fighting force in as strong and perfect condition as possible, that it may the more easily, and with the least injury to itself, destroy the enemy. Humanity is fighting disease, and fighting with weapons we call sanitary measures. In the majority of minds, not educated to the contrary, there is the idea that too much attention is paid to the attempt to destroy *disease* in all its forms, in proportion to that paid to the cultivation of the individual to that highest physical development which will enable him to render the best possible service by reason of imperviousness to it.

Captain Landon then dwelt on the important part physical culture had in the life of ancient times, especially in Greece and Rome, and of the loss of interest that seemed to follow those times until comparatively recent years.

The recognition of the importance of physical culture has been slowly gaining ground, particularly among the colleges and secondary or preparatory schools. But in securing "the greatest good for the greatest number," he strongly argued that in the public schools is the greatest need and the largest field for the best results. The greatest need, because there is where the least work in this line has been done. The largest field, because there are found the greatest number at an age susceptible to development of any kind, so that the coming generations can be made a taller, broader, straighter and stronger type of manhood. The greatest obstacle to advancement lies in prejudice. The idea that the boy goes to school to study and wastes time when he devotes it to physical culture has to be overcome. He quoted an article from *Harper's Weekly* of December 3d, on "Foot-ball and Study," as apropos, advocating the need of physical exercise with study as tending to better bodies and longer lives.

Captain Landon, in his argument for "a sound brain in a sound body," calls special attention to the fact that the brain is a *part* of the body, and dependent, therefore, upon the condition of the body for its force and vitality; that the whole is greater than its parts, and, therefore, the preservation and cultivation of the whole cannot but benefit all the parts thereof.

He illustrated this point as follows: "I have had more than one boy to come to me sluggish in body and mind, so sluggish, indeed, that after giving him a command you might with a watch time the action of his brain and its control over the members of his body. Body undeveloped, brain constitutionally *tired*. After a few weeks or months of the 'setting-up' exercise and the development of the muscles, we find him *strengthened*, but, more important far, we find him as a whole more a master of all his members. His mind or will-power do not require *time* to communicate its *desires* to his members, but *flashes its commands* instantaneously."

A few weeks' physical culture made him a better conductor of intelligence and energy. He spoke of the fact that New Jersey has recognized the importance of this subject as shown by the physical culture department in its school for teachers at Trenton. This means that the teachers are being educated in this direction, but it will depend somewhat upon the sentiment of the localities into which they may be sent whether the work will get beyond the theoretical. In conclusion, he spoke of the question of system as secondary until the people are brought to realize the importance of the introduction of physical culture into our schools.

Hon. Addison B. Poland, State Superintendent of Public Instruction, opened the discussion on Captain Landon's paper. He thought there had been a great advance in the education of our school authorities, as to the importance of physical culture in our schools. In most of the schools some method of physical training has been introduced, and the public, to some extent, has come to understand its importance. He thought it was now a question as to the best method or system. He dwelt on some of the systems that have been suggested. He thought there was a great deal of sham in much of our athletics, gymnastics and calisthenics. He believed one of the most important conditions for good health is abundant and proper respiration, and those systems were best in which that fact was recognized. If our children were taught to stand erect, walk right and inhale properly, a great advance would be made, and he argued against the system of weights, which tended to harden the muscles. That is not needed to secure good health. He thought weight-lifting tended to cause stooping, and believed exercise in the fresh air, walking erect, would yield better results. He closed urging physicians to use their influence with School Boards, for most of the difficulty in introducing proper physical training exercises came from their indifference or opposition. There would then, in his judgment, be no trouble with the public to get them more interested.

Dr. H. B. Boice, Instructor in Physiology and Director in the State Normal School Gymnasium, continued the discussion.

Considering physical education from the narrow standpoint alone of its bearing on health, it is desirable to exclude what does not belong to it and to call attention to at least one fundamental requirement which should be constantly borne in mind. The science of physiology must be the basis of the art of physical education, and we must view with suspicion, not unmixed with amusement, a system such as the Delsarte, one of whose exponents affirms that erratic movements of the extremities are injurious, since they cause nerve force to flow off the finger-ends, which should return to strengthen the trunk.

All exercises have effects, and if made without definite purpose these may easily be injurious.

Athletic sports and heavy gymnastics may be recognized as physical education to perhaps the extent that the acquirement of Greek is in making an educated man—desirable, not essential. And the apparently resulting injuries to heart and lungs—now nearly eliminated by a preliminary physical examination—should be considered in connection with the widespread lack of soundness of those organs in adults, and also with the marked benefit to the moral nature of the participants.

The point already referred to of an erect carriage and a capacious chest should be a prominent feature of any system of physical education; and noting the fact that school life is at constant war with the attainment of this end, any day's exercise which has not a bearing on this point falls short of its most essential requirement.

Capt. T. D. Landon agreed with Supt. Poland as to the importance of attaining a proper carriage, and the system of training adopted should recognize its importance. Prof. J. Madison Watson, of Elizabeth, thought we had been discussing the importance of physical training long enough in this Association; the time had come for more decided action and endeavor to secure in our schools and colleges some good system of physical training. But he had long thought and taught that this training should begin in the nursery of every home. The State should take decided action and do for the children of the State, through our schools, for the benefit of the State for the years to come. Physical training, in connection with mental training, is what we need in our schools, from the youngest child up, to secure a symmetrical training, so as to have men and women strong in every part of the body, He believed this training is needed in our rural districts as much if not more than elsewhere, and in all places there should be training with regard to results, with inspection as to progress made.

Principal James M. Green, of the State Normal School, called attention to the fact that the State is doing something. He spoke of the work in the Normal School under Dr. Boice's superintendence. He also spoke of the fact that no licenses are granted to teachers without satisfactory examination on these subjects.

Dr. Dowling Benjamin, of Camden, spoke on some of the defects in physical training and dwelt upon the proposition that students should be examined as to their individual needs in the training process, and be trained in the direction such examination indicated for each individual.

Mr. J. W. Morey, of Lakewood, spoke of the physical training that was being done in the Young Men's Christian Association gymnasiums as most excellent, and that in most of them in our cities the training was more or less according to the needs of each individual. He thought these associations were doing more good in awakening the public to right estimates of the importance of physical culture than any other agency.

SCHOOL ARCHITECTURE.

George W. Debevoise, Esq., architect, of New York City, spoke on "School Architecture." From Mr. Debevoise's long experience, having had the supervision of the construction of some forty-one public school buildings in New York City, he spoke of the definition of architecture "as necessitating the possession by the builder of gifts of imagination as well as of technical skill." In preparing an address for the purposes of this Association it would appear that he should present details of a purely technical character, relating to the health and comfort of pupils and teachers, rather than attempt to present ideas that would run counter to the varied imaginations of city and county censors, who define school architecture, so far as the exterior is concerned, as an opportunity for the expression of their own locally-educated tastes, and very generally insist upon an application of the same instead of accepting the trained imagination of an architect.

He then spoke of the selection of a site for a school building as requiring the most careful attention. It should embrace all the advantages of situation, natural drainage, &c., while removed from noise and anything that would attract the attention of the pupil. We should never entertain the old idea that property which could not be utilized for any other purpose presented a proper site for a school building. The selection of a corner site should be insisted on, the southwest corner being preferable. Where such a site cannot be had the amount of ground should be increased in acquiring inside lots, and these should be on the south side of the street, both selections enabling the front elevations to face prevailing storms, giving protection to the yards or playgrounds and exposure to the sun. He said that, on the principle that nothing is too good for school purposes, all buildings should be constructed with fire-proof materials, not exceeding three stories in height from the curb or grade level, with playground upon the roof and sanitary appliances, for grammar pupils, in the absence of a liberal provision of ground (often found in cities), and the building should not cover more than 60 per cent. of the site. The entire space covered by the building should be excavated to a depth of ten feet, if sewer connections will admit of it, the cellar nine feet in clear height and made light by a liberal use of area openings; all drain-pipes to be exposed above the cellar floor until the sewer connection is reached, care being taken in mechanical details to have the cellar dry and well appointed for use of heating and ventilating apparatus.

The first floor, ten feet in clear height, to be used in inclement weather for a play-room, divided by partitions for use of girls and boys, and also used for other purposes in connection with physical training, furnishing in addition space for drying-rooms, with individual clothes closets and drinking fountains (he preferred the "Campbell" style), inclosed passages being provided from this story to the sanitary apartments in the yards, with full protection to pupils, and both passages and apartments to have the temperature in excess of the balance of the building, or at least equal thereto. The side walls of this story to be of light-colored face brick, all projections being rounded with bull-nose brick; window sills of dressed stone flush on the inside of wall; all doors to open outward. The floor to be of comb-grained yellow pine, laid in hot asphalt, and rubbed together in laying so that joints are filled, the "Nightingale" system of flooring being preferred. No cement floors should be used in play-rooms, the generality of pupils being insufficiently shod, and with the suspended animation caused by class-room work they are not prepared to withstand the cold surface of such a floor without injury. In the absence of regulations requiring an assembly of pupils, the upper stories, each fourteen feet in height, being devoted to class-rooms, the use of the corridor system is advised, but all class-rooms should be connected, furnishing passages, independent of the corridors, to the stairways. Stairways to be of width sufficient (he recommended three feet eight inches) for two pupils only to each step, constructed of plate-iron stringers with angle-iron supports riveted thereto to receive the treads and risers; latter of iron, treads of bluestone two and a half inches thick, dressed on all surfaces and chamfered on four nozing edges; steps laid in putty, additionally secured by two lugs bolted on angle-iron riser support, enabling the step when worn to be reset with an unused edge of tread to the front. Continuous hand-rails of one-and-a-quarter-inch pipe on both sides from top to bottom, with easements at all turns. All stairs to have floor and intermediate platforms; the risers not to exceed six and three-fourths inches in height and treads not less than eleven and one-half inches in depth. All stairs to be uniform. All doors opening upon stairways to be of split-door construction, moulded on class-room side and butt and bead on stairway side, with No. 18 gauge sheet-iron entire size of door between the parts.

He did not advise slate steps and platforms. They lasted but six years with constant use, and towards the latter part of that time were dangerous from the prominence of the incorporated flint, owing to the wear of the softer part. Bluestone steps, &c., will last as long as the building. Double stairways are preferable, enabling the same to be placed within the same well-hole required for a single stairway by adding about five feet to the depth.

The minimum size of class-rooms should be 24x26 feet; maximum, 26x28 feet; calculating 40 pupils per teacher; these dimensions allowing the natural tones of voice of both teachers and pupils to be clearly audible, while a larger room leads to the use habitually of high-pitched voices. The interior finish of a class-room practically determines that of all parts of the building, and should embrace an entire absence of all projecting finish, either upon side walls or surroundings of windows and doors, in the shape of trim; also of crevices or cracks to hold dust, either in the floor or other fixed construction of the room. That the amount of light determined by size of windows be not less than 20 per cent. of the floor space, while an increase to 35 per cent. can be had by the use of iron or stone mullions, and is preferable, the use of Venetian blinds moderating any excess not required.

He recommended the use of furring brick, as it enabled the plastering to be done without leaving space at outside walls for vermin, and the partition, if constructed of fire-proof blocks, aids the same purpose. Plastering to be of two-coat work, the finishing coat of the hardest known kind, colored a neutral tint, and all plastering to be continuous with bull-nose or rule-joint at angle of return to the window-frames and doors, thus avoiding all window and door trim. The hanging and striking styles of doors to be of iron, while the base or wash-board around the room can be of iron or slate; all sills of windows to be of slate, and the floors to be without obstruction in the shake of the door-saddles, &c. A simple cove can be formed at intersection of wall and ceiling, without projections, if it is desired to have a cornice for subsequent decoration.

In the case of buildings not erected with fire-proof materials the conditions named before will apply, by the building of brick well-holes for stairways and the use of wire lath secured over the top of beams, with a depression of the lath between them of three inches, this space filled with fire-proof plaster material for deafening and fire-proofing purposes, and by the use of metal ceilings. The use of working floor laid diagonally and covered with four layers of one pound per yard felt paper, upon which the finished floor is laid, is considered best where fire-proof qualities in the building are not provided in erecting it.

Principal James M. Green, of the State Normal School, in opening the discussion spoke of the thoroughness in which the subject had been presented. He then referred to the efforts made by the New Jersey State Teachers' Association in this matter. They recommended that an appropriation be set aside by the State for securing knowledge as to the construction of proper school buildings. The money has been expended in getting up particular methods of construction. It should be expended for getting up plates and information to send over the State. Every Board of Trustees, in his judgment, should be compelled to submit their plans for construction of school buildings for criticism to competent authorities, and the public should be informed sufficiently to take greater interest in this matter. The politicians will generally be on hand, but the politicians do not wish to go against the will of the people, hence information concerning the proper construction of school buildings should be disseminated.

Superintendent Vernon L. Davey, of East Orange, expressed his surprise that in the State of New Jersey there were so few properly-constructed school buildings. He was glad that this association had had the question brought before this meeting and that it had been so ably presented. He thought the members should take a deep interest in the construction of these buildings, and especially in their construction according to the requirements of sanitary science. He thought the average School Board needed instruction. They will insist on having 48 to 50 pupils in a room 24 by 26 feet. He spoke of light as a very important matter in their construction. Of the cloak-rooms, that they should not be in halls. The heating should not be by direct radiation. It should be by some system that would throw into the school-room a large volume of fresh air, &c.

ARCHITECTURE IN RELATION TO SANITATION.

Architect Arnold H. Moses, of Merchantville, was introduced and read a paper on "Architecture in Relation to Sanitation." He spoke upon the impossibility, in the short space of time allotted him, even of touching upon all the phases of the subject, much less of discussing them thoroughly. He therefore would discuss only three points:

1. The present stage of scientific development in plumbing apparatus and arrangements.
2. Heating and ventilating, and the best methods of obtaining a good and satisfactory system of each.
3. Suggestions toward improvements in the methods of building, water-supply, disposal of kitchen refuse, drainage and sewage. He remarked, by way of preface, that architects, as a class, are glad to receive and act upon the recommendations of physicians, as far as they can, and that a great advance in sanitary arrangements might be made if the medical profession would assist in condemning the close, dark, and badly-ventilated rooms and imperfect sanitary apparatus so often found, not only in the row of tenement-houses put up by the speculative builder, but also in houses of a higher class. The people have become educated to the point that they insist on having in a house a water-closet, bath-tub and sink. These call for a supply of water and proper plumbing arrangements for the use of the water, so that it can be disposed of without danger to health; thus a special prominence in building operations is given to the plumber's work. Mr. Moses referred to the relation of sanitation to architecture as a close one, and argued that it is the duty of the architect to obtain a knowledge of the principles governing the arrangements of the plumbing in a house, and insist, so far as they can, upon the use of the best apparatus, which should be put in as simply and compactly as possible. He gave the following as the main points to be observed in placing fixtures in a house: Supposing there is a sewer in the street, the connection should be made with vitrified earthen sewer-pipe, if in the natural ground, but if the sewer is in made ground, iron pipe should be used. All pipes inside the house should be metal, and the main iron sewer-pipe should commence near the outside of the wall, and a running trap, with a ventilating pipe leading to the outer air, should connect with the cellar drain on the house side of the trap.

The house drain should receive the contents of the upright soil and waste-pipes through Y branches. The upright lines of iron soil and waste-pipe should be carried out about three feet above the roof and should run as straight as possible, and all the branch pipes should be connected with them by Y branches. When all the main lines of pipe are up, the joints thoroughly caulked with oakum and molten lead, and the branch pipes closed up, the whole system should be tested by closing up all openings and filling with water and allowing the water to stand for some time in the pipes. All pipes should be laid as straight as possible. Every fixture should be trapped, and each vertical line of soil-pipe should have a line of pipe of reduced caliber for providing back air, or ventilation of the traps of the different fixtures, which pipe should also run out above the roof the same as the soil-pipe and connections should be made with it by branch pipes taken from the crown or top of each trap. The water-closet should be of porcelain all in one piece, the bowl of which should always contain a sufficient quantity of water to form a seal or trap.

The closet should be set on a marble slab or floor plate, and the trap underneath the floor should be ventilated. The closet should always be flushed from a cistern placed some distance above it, so as to discharge water with considerable force into the closet bowl and completely empty it and the trap of excremental matter. Water-closets should not be flushed by means of valves from the water-supply pipes, but there should be a separate cistern supply to all these fixtures, so as to keep water intended for domestic use from all danger of pollution. These rules embody the essentials which go to make up the proper execution of a plumbing contract.

He next dwelt upon the heating and ventilating of the building as having a great deal to do with the health of its occupants, and they are too often left to chance or improperly slighted. No heating can be satisfactory without ventilation. He considered three methods—open fire and furnace heat, steam heat, heating by hot water. Each had points of merit. The great point to be observed is the introduction of pure air, warmed in its passage around the furnace or through the radiator.

The system of furnace heat with no means of ventilation is crude and bad. So with steam and hot water where there is no fresh-air supply, whilst the open fire-place is insufficient to thoroughly warm a room, and has the disadvantage of causing a strong draught or current of air to flow upon any person sitting in front of it. Indirect radiation, although much better, is often unsatisfactory on account of the lack of proper methods of ventilation and arrangements to keep the air moving. The essential thing for the successful, healthy heating and ventilating of a building is that the circulation of air be maintained. He referred to the two methods of doing this—first, by natural draught; second, by mechanical means, such as fan-power, &c.

Mr. Moses called particular attention to the first method in its application to ordinary dwellings of eight or ten rooms, warmed from a heater in the cellar, and showed how the principles he had insisted upon could be applied:

1. The heater should be located in the cellar, so as to give the shortest runs possible to each rising pipe and to give as much inclination as possible to these pipes.

2. The fresh air should be brought direct from the outside of the building to the air chamber in the heater, and no cellar air should be allowed to get to it. He preferred the cold-air box, made of galvanized iron, with two or more fine wire screens in it as filters for the air, collecting the large particles of dust, &c.

3. The size of the heater should be determined by the cubical contents of the house, the sizes of heat-pipes and registers proportioned to the cubical contents of the room to be supplied. There should be a ventilating register of at least three-fourths the capacity of the warm-air register located near the floor of the room and connected by a separate flue to the cellar and thence by galvanized iron pipe to the kitchen chimney, which chimney should be of sufficient size to carry off the exhaust or vitiated air, and as there is nearly always a fire in the range, a continuous circulation will be kept up. The same system of ventilation could be used if direct steam or hot water is the medium of heating employed, except that in order to provide for the introduction of fresh air, separate openings would have to be made near the back of the radiator, which is done in some styles of radiators now in use. This system is inexpensive and could easily be put in with the heating arrangements of the house.

While he regarded plumbing, heating and ventilating of a house mighty factors in preserving the health of the occupants, he thought there were a number of other points demanding the attention of the architect, and spoke of the following: Grouping of all the plumbing apparatus in certain parts of the building; arranging places for the reception and disposal of kitchen waste; building of the house so it would be free of dampness; allowing no inaccessible places where dirt and dust can accumulate; windows in sufficient number to insure the beneficial action of sunlight and fresh air in each room; no plumbing fixtures permitted in bed-rooms, and rooms in which plumbing apparatus is placed should have immediate connection with the outer air. The architect should join with the physician in trying to awaken a desire for better and more suitable arrangements than now exist in the majority of buildings. The architect, as a sanitarian, should study as the main points, the following:

1. The situation of the house; the kind of ground; where this is not pervious, insist on drains, &c.; covering the cellar floor and the outside of the walls with a thin coat of asphalt, then cementing top of the cellar walls to prevent the dampness rising by capillary attraction. Also it is well to place a damp-course of asphalt or slate set in cement.

2. The roofs should be constructed so that the water will not lie upon them, and the eaves should project so as to throw it off and prevent it running down the walls. The rain-water conductors should, wherever possible, be carried down outside the house to proper drains at the ground-level and leading into an open gutter, but not connected into the main sewer.

3. In the interior of the house the floors should be laid as tight and close as possible, and care taken in putting up the finishing woodwork, so that cracks or badly-made joints do not occur, to prevent accumulation of dust. He suggested instead of papering walls they be frescoed in water or oil colors; they can then be washed when necessary. It is a much healthier method of decorating and costs very little more.

4. Concerning water-supply to dwellings, &c. It is of the greatest importance that it should be from uncontaminated sources.

5. The removal of dust, kitchen refuse, &c. He is greatly in favor of building in the basement or cellar a specially-arranged furnace, connected with a flue rising alongside the kitchen chimney, in which all this refuse could be burned up as often as necessary.

6. In addition to what he had before said of the principles governing the arrangement of the plumbing apparatus, he spoke in regard to carrying the water from these fixtures, and said he did not know of a better method than the water-carriage system, but recognized the fact that the final disposition of this waste was a very serious one, as affecting the health of the community. While for isolated buildings a well-ventilated cesspool, with arrangements of open drain-pipes for carrying off the overflow and using it for irrigating purposes, is probably the best, yet he was convinced it is not the right thing to employ in a village, borough or small town, and will, sooner or later, poison the water-supply and become a serious menace to the health of the community. He believed the only proper method of disposal is by running all the waste of such a place through terra cotta pipes or brick sewers by gravity to a large, thoroughly-cemented and tight cesspool, and then pumping it from thence into a subsiding tank, from which the liquids could be drawn off into a further tank or reservoir and then purified by the use of lime or other purifier, and from that allowed to escape into some convenient watercourse, the solids being dried and converted into fertilizer.

Civil Engineer George P. Olcott, of East Orange, regarded the paper as an able one, and regretted that in the few minutes allotted him he could not do justice to the subject in opening the discussion. He spoke of the great importance of the proper construction of the cellar. If there were unsanitary conditions there, the care in construction of other parts would be of little avail. He objected to any trap between the house and any sewer or cesspool. You cannot depend upon a trap outside your house wall. In his twenty years' experience he had observed that the architects give vastly more attention to outside appearances than to the cellars. They will too often cut down the plumbing requirements to put on the fancy touches on the outside for appearance' sake. Let them give more attention to the cellar. He cited instances where diphtheria had been carried into houses through the cold-air box. He dwelt upon the importance of thorough drainage and cellar ventilation.

Mr. Debevoise spoke on the importance of having the soil-pipes equal to the steam-pipes in a building, and they should be sixteen feet long.

SATURDAY, December 10th, 9:30 A. M.

Dr. Henry Mitchell, of Asbury Park, opened the discussion on

ERRORS IN PLUMBING AND THEIR PREVENTION.

Dr. Mitchell spoke of several cases recently met with in the usual course of the application of the ordinances which are in operation in Asbury Park for the prevention of dangers to health due to unsafe constructions of house drainage systems:

1. *Covering Cracks in Iron Pipe by the Use of Sealing Wax.*—During the construction of a new drainage system in a house on Fourth avenue, the Inspector of Plumbing observed a mass of material lying up the hub of a four-inch Y branch. At first glance it seemed to be lime mortar which had fallen from the newly-plastered walls, but when it was pushed aside a reddish color was visible, which, on closer observation, proved to be sealing wax used to mend a cracked pipe. The plumber had probably found a leak in the lead joint between the hub and the brass ferrule, and in caulking he had struck too hard a blow; then he hoped to patch up his work somehow, so that it would remain tight long enough to pass inspection.

Allusion was incidentally made to another feature of this case to further show the need of skilled inspection of plumbing. The waste and vent-pipes were filled repeatedly with water to locate leaky joints, and days were spent in caulking the openings. This was done, notwithstanding the plumber knew that a pressure test was to be applied and therefore that great care must be taken in doing the work in the first place. So difficult do the plumbers find the task of making drain-pipes tight that it is highly improbable that any job is ever tight unless it is tested to show where the openings are located.

2. *Entering Lead Pipe into Lead Pipe.*—Cases were related to show that careless workers will, if no inspector is at hand to prevent the practice, join two lead waste-pipes at an angle, by inserting one pipe into the other, so that a projection is left to catch shreds, threads, hairs, &c.

3. *Trap Syphonage.*—Dr. Mitchell cited numerous cases in which inspections of old work disclosed syphonage of unvented traps be-

neath wash-bowls in bath-rooms. These were instances of the bad, but very common, practice of joining the waste-pipe from the bowl into the waste from the bath-tub, and then leading these combined waste-pipes into the lead bend beneath the water-closet. These cases exhibited clearly the danger to which the inmates of a dwelling are exposed, in which the construction here referred to has been followed, and they also show the value to house-owners of the service of an Inspector who is able to defend them against such errors in the erection of a house.

4. *Running Vent-Pipes on Down Grades.*—Many plumbers appear to consider vent-pipes useful only to swell their bank accounts, by making a display of work to better explain the large price charged for a job. Waste-pipes will refuse to carry fluids if they are too much choked up by intersecting pipes or by other heedless disregard of the principles which govern the flow of fluids, but there is less risk of detection if vent-pipes are not honestly constructed. Instances were referred to where traps were formed in vent-pipes by carrying the pipe down and around a timber or some other projection. Vent-pipes which have a down grade can carry air currents only at great disadvantage, and if a trap is formed in such pipes condensed water may render them useless.

5. *McClellan Vents and Back Pressure.*—A case was described where the house drain became partially obstructed at a point near the foundation wall. The soil-pipe extended, full size, through the roof, and all traps were vented by 1½-inch pipes taken from their crowns and returned into the soil-pipe, except the trap beneath the wash-bowl. A McClellan vent was attached to this trap. When the water-closet was discharged the water in the wash-bowl trap was forced upward and out into the bowl. If this trap had been vented by a properly-constructed air-pipe the seal would not have been affected by compression of the air in the soil-pipe.

Numerous other errors, oversights, blunders and frauds in the construction of house drainage systems were described. The facts presented showed, in the speaker's judgment—

1. Official inspection of plumbing is necessary to protect the health of the occupants of dwellings.

2. Such inspection protects the owners of houses against frauds on the part of contractors.

3. Faulty construction of house drainage systems is sometimes due to ignorance on the part of the architect or of the plumber. It is sometimes due to heedlessness and disregard of the dangers to health which attend the entrance of drain air into dwellings. It is far more often due to mercenary scamping.

H. B. Francis, Esq., City Plumbing and Drainage Inspector, Camden, spoke as follows:

The question of errors in plumbing or practical sanitary work as applied to our dwellings takes so wide a range and brings into the controversy the physician, civil engineer and architect, in fact all who are concerned in the erection from cellar to roof. First, proper disposal of our sewage, separating the fluids from the solids and by proper treatment rendering it harmless before discharging into our streams, for in the future we must cease polluting our streams, particularly those from which we draw our supply for household purposes. Build our sewers to conform to the topography of our cities and towns, looking to the future increase in population and manufacturing interests that use the sewers for the discharge of their waste matter. All sewers in cities should be laid in cement and made a tight drain, so as to prevent the escape of sewage into the soil. In connection with our sewers when made tight there should be public flushing tanks where the grades are low. Then the connection to our dwellings with private drains should be absolutely tight, whether terra cotta or iron.

The drain within dwellings should be of iron of proper size and graded so as to admit of proper flushing. No drain should be permitted to enter a dwelling, particularly in cities of low grades, without a trap at the curb and perfectly level, so as to retain water-seal and overcome entire unsealing by water-drag or syphonage. A cold-air inlet in the house side of the trap with attachment to catch sweepings and sand and prevent obstruction to trap; from thence direct to roof for ventilation, and no obstruction or depressions to retain condensation, which causes oxidation.

All connections with rain conductors should be made with deep sealed traps with clean-outs, and the seal should be at least six or seven inches, so as to overcome evaporation in extended dry weather.

All fixtures within dwellings should be securely trapped, and where close to sleeping-rooms the use of the bottle, ball or seal trap with floor-plate, so as to be easy of access.

All drain-pipe within dwellings should be above ground, resting upon piers or hung from the joist. Water-closets should never be placed in basements or cellars, owing to their position being difficult to light or ventilate, thereby inviting uncleanliness. No wash-basin or fixture connecting direct with the drain should be permitted in bed-room or store-room containing food or clothing; or, if permitted, should be by open surface drainage, *and that by permission of the Board of Health.* He recommended that all buildings in which connections are made, the owner should be compelled to use a ferrule and water-supply sufficiently large to insure the proper flushing of all fixtures, as a fixture and trap are often condemned from insufficient water-supply to flush and keep the seal of traps intact.

Prof. Keyser, of the Philadelphia Board of Health, spoke of the iron pipe which has been used so extensively for many years as having been varnished over, which pipe is very apt to contain pin-holes, undiscoverable because the varnish covers them over. All pipes should be tested by sulphur, mercury or other tests.

Civil Engineer Chas. B. Brush, of Hoboken, thought this question a very practical one. We know that diphtheria and other diseases come into houses through defective drains and plumbing fixtures, and too much caution cannot be used to protect our homes. He emphasized the point that we should not accept as conclusive any of the suggestions made. The question of traps between the house and the sewer is an open one; do not let us decide it hastily.

Mr. Githens, of Asbury Park, said: We should understand that the kitchen is as important as the bath-room; it is generally plastered, then it is scrubbed, then painted and repainted until we often get considerable filth on the kitchen walls. It is better to use North Carolina pine and false ceilings, so that we can keep the walls and ceilings clean. He gave account of how he had his own kitchen arranged in this way, with an open sink. He used no base-boards, only moulding.

Civil Engineer C. P. Bassett, of Newark, also emphasized the point made by Engineer Brush, that we should be very slow in accepting conclusions of any authority in reference to disputed points on plumbing, for example, as to a trap between the house and the sewer or cesspool, but he did insist on the observance of the principle of circulation in the pipes; we do not want to bottle up the trap. If in putting on traps we interfere with circulation, it is unquestionably injurious, and we should bear in mind that the presence of a trap involves a certain amount of putrefying, decomposing materials. He spoke of the present modern system of sewers, perfectly ventilated and properly flushed; where we had such sewers he would certainly leave off the trap.

OFFICIAL DAIRY INSPECTION AND SANITARY MILK CONTROL.

Prof. Albert R. Leeds, Ph.D., of Hoboken, read a valuable paper on "Official Dairy Inspection and Sanitary Milk Control." We omit synopsis of it here only because it will appear in full in the annual report of the State Dairy Commissioner for this year, to which we refer all who are interested in this important subject.

Commissioner McGuire, after indorsing the views expressed, dwelt upon the principal method to-day used in robbing pure milk of its nutrient value in the abstraction of cream, or, when more convenient, the addition of skim milk, and that this is so skillfully done by some dealers that their profits are greatly enhanced without their milk falling below the State standard. The other means of deterioration of milk is in the addition of water. He spoke of the error people made in considering the dilution of milk as a mere commercial fraud, for it often involves most serious consequences to health and life, as it is the most important article of food for the nourishment of young children and invalids, and is sometimes adulterated with water from infected wells. He then spoke of the necessity of extending inspection to the sources of supply—the cows, their food, care and sanitary surroundings of the stables in which they are kept, &c. While milk from our country districts, where the cows are fed on proper pasturage, have an abundance of pure air and water and in the evening well housed in clean, airy stables is popularly believed to be the best, yet it is possible to conduct a milk dairy in a city and have a milk of fair quality, as has been demonstrated in many parts of Germany. In Hudson and other counties, where large cow stables are maintained, the reverse of the German method prevails. Filth is the rule; the stables are foul, the cows are dirty and poorly cared for, and the product, though up to the legal standard of purity, is dangerous as an article of food.

He spoke of milk as a good medium for carrying contagious diseases; absorbing odors easily; as easily affected by dirty surroundings, and as a good hot-bed for the culture of disease germs.

He described the condition of many of the cow stables in Hudson and other counties, where many of the men engaged in this business know nothing of the rules of sanitation and are altogether incapable of conducting a clean, healthful dairy.

In one place visited, a barn containedsixteen cows; the floors of the barn and the cows themselves were covered with filth and were fed exclusively on brewers' grains; the water was carried to them from a well in the yard, and they were tied in their stalls from September to May. In another place 103 cows were confined in a barn which was poorly ventilated, with little or no drainage, surroundings filthy, fed on brewers' grains. In both these cases the milking and straining were done in the midst of this foulness. He had no doubt that under these circumstances the milk is unwholesome, if not absolutely poisonous. He had a list of about one thousand stables in Hudson county alone where cows are kept, and he ventured to assert that 75 per cent. of the cattle are fed on brewers' grains. These grains used exclusively for feeding milch cows are generally, by competent authorities, condemned as an unwholesome diet. He quoted from Dr. Munstell's report to the New York State Board of Health.

The trained Inspector meeting with milk from such cattle can readily distinguish it by its peculiar odor, insipid taste and watery appearance, and the chemist's report invariably shows its great deficiency in fat. He spoke then on the question of closing such places as he had described; that the Local Boards of Health of the localities in which are these stables have full, ample and absolute power, and could, if they wished, close every foul cow stable in the State; they could prevent the herding of cows in closely-confined places, and could, in fact, do anything needed with the power they now possess. What is now needed is the *will*—the *way* is provided. The Dairy Commissioner has no power in the matter beyond prosecution in cases of adulteration, or in cases where actual disease of the cow is proven. The United States authorities can only compel the slaughter of cows actually diseased with contagious or infectious diseases. He then called attention to the two difficulties: first, the Local Boards of Health will not act vigorously; second, the State authorities cannot act without new powers given by law. In reference to the latter, he argued in favor of additional power with an ample appropriation to provide for thorough stable inspection. There should be additional legislation defining what a crowded or unhealthy condition is; prescribing the condition of stables, and providing for the inspection thereof; regulating and enforcing the cleaning of the same, and requiring proper exercise for all cows kept for the production of milk, and the food to be used for the same.

If a license was in every instance required to enable persons to sell milk, such license to be granted by the Inspector each year and only after inspection, the business of selling milk, and also the proper keeping of cows, could be readily regulated. It might also be of great benefit to make the sale of milk from sick or diseased cows, and the maintaining of places for the keeping of cows in an unhealthy condition, a misdemeanor punishable not only by fine, but imprisonment also in the county jail.

Dr. E. O. Shakespeare, of Philadelphia, was then introduced and spoke of the great importance of this subject, and especially in connection with our anxiety concerning the possibilities of a cholera epidemic. He regarded it as one of the greatest questions of to-day. The general public should be well instructed as to the necessity of enacting laws to secure purity, as the number of deaths from an impure milk-supply far exceeds the deaths from cholera. The subject had been presented in a masterly manner by Prof. Leeds and well discussed by Commissioner McGuire.

The health officer should receive from the public far greater support to insure the highest success in protecting the people from impure milk, and he argued in favor of New Jersey moving in concert with New York and Pennsylvania, as they were all interested equally and could assist each other by uniformity of law and administration. He agreed with Mr. McGuire that the pollution of milk with impure water was the most prevalent and serious danger, from pathogenic germs spreading disease.

Dr. Keyser, of Philadelphia, seconded the proposition for co-operation of States to secure uniformity of law and administration, and suggested that it include Delaware.

Judge J. A. McGrath, of Jersey City, spoke of his deep interest in the paper and the discussion that followed its reading. He thought we could hardly overestimate the perils of an impure milk-supply. He suggested and afterwards moved that an abstract of the paper be furnished to the papers of Hudson county, that the people might be aroused to a sense of the dangers to which they are exposed from this source.

Dr. Dowling Benjamin, of Camden, spoke of the wisdom of such publication, and on his suggestion it was voted to furnish such an abstract to the leading papers of the State, as the dangers from impure milk were not confined to Hudson county.

W. B. E. Miller, D.V.S., of Camden, said he thought the most important question in the discussion was in reference to the inspection of cattle as relating to tuberculosis; that it far transcended, in his judgment, that of the pollution of milk by diluting it with impure water. There was need of very stringent laws to prevent the spread of this disease in cattle.

After a few remarks from Dr. William B. Atkinson in reference to the need of more stringent laws, Dr. D. C. English moved, and it was carried, that the part of Prof. Leeds' paper referring to the enactment of the law which he outlined be referred to the Committee on Legislation.

CHOLERA.

Dr. Henry R. Baldwin, of New Brunswick, in an interesting and practical address, opened the discussion on "Cholera."

He spoke of the Asiatic cholera as having begun its epidemic ravages early in the present century, as it followed the trade of the caravans, and defined it as a communicable disease which followed the line of human travel, characterized by copious watery evacuations and vomiting, with cramps, and which, unless speedily arrested, runs into collapse to terminate in death. He spoke of the attempts made by some to minimize the terrors of cholera by the statement that in England it only destroyed one in sixteen or seventeen thousand of the inhabitants, whereas in some places the deaths were 1 in 56, and in other places 1 in 140 of the inhabitants. Some idea of its amazing mortality may be had when we remember that it killed in Hindostan alone, in the year 1878, 318,000; in 1881, 161,000; 1887, 488,000, and in 1888, 270,000, more than one million in a period of ten years. Previous to 1854 this disease was not considered contagious, various theories being held as to its mode of spread. Cholera atmospheres were spoken of; ships crossing the sea were supposed to run into such cholera waves. During an attendance upon the cholera wards at

Bellevue Hospital, in 1854, the speaker found himself suffering from a constant diarrhœa, requiring treatment, with daily cramps when going up and down stairs. The conviction was then forced upon the mind and freely expressed that the disease depended upon a specific poison having its seat in the blood. It is an interesting fact that during cholera epidemics the early cases mostly die while the later cases mostly recover. He thought it seemed not unreasonable in the light of recent developments to suggest that the cultures which take place in the human intestine become more and more attenuated and lose much of their vitality. He spoke of the older methods of treatment as consisting of the use of narcotics and astringents—stimulants, internal and external; calomel was sometimes used largely, even in doses of sixty grains, and in some cases with success (is it possible that this was due to any germicidal power?); transfusion; injections (*intra-venous*) of saline solutions, also injections of warm water and warm saline solutions in the areolar spaces. Dr. George Johnson suggested a treatment by purging with castor oil, and there seems some philosophy in the suggestion, as the intestine might thus be cleansed of its irritating tenants, and, in fact, the conservatism of Nature gives force to the inquiry whether the copious defluxions are not an effort to carry off the offensive matter. The investigations of Dr. Koch and other diligent workers in the field of bacteriology have given a new phase to the whole subject. The cultivation of the bacillus, its attenuations and potency in cultures; the discovery of the productions of ptomaines by a subtle chemistry, either of excretion or secretion, and their powerful effect upon the human economy; the proved long viability of the bacillus—over two years in agar cultures; its viability in various solutions and substances—in fæces, stale urine, fresh urine, aërated waters and various vegetables lasting from two to nine days; the experiments upon animals and the resulting immunity, or again the production of the disease by intra-peritoneal injections have caused a new light which demonstrates the futility of former management. Dr. Baldwin then dwelt upon the mode of spread of the disease. Primarily and pre-eminently the human intestine is to be considered particularly suited to the cultivation of the dangerous little organisms, therefore the dejections are one of the most potent factors of spread. Consequently privies and soiled garments may spread it; it may be spread by mild cases transporting the germ; wrapped up in stuffs it may be carried long distances and when opened, long after, give rise to a new focus of disease. How shall we treat our foe? Kill it by germicides; carbolic acid, mercuric chloride, heat, steam, boiling water kills life. Have food, especially milk, carefully watched and all drinks boiled. Nor is this all. James Ferran, in 1885, claimed that he could render animals immune by inoculation, but for some reason the claim was not allowed and it fell into desuetude. In 1888 Klemperer, Gamallia, Haffkin and Lazarus all followed in the same line, and these experiments, as well as those upon the anti-toxic properties of humanized serum, discovered by Behring, all give high expectation that this malady may be met and conquered early upon its introduction into any country.

Dr. F. Gauntt, of Burlington, spoke of the activity of the State Board of Health last August and September, by conference with the Surgeon-General at Washington and with the various Boards of Health in our State, in order to put our health authorities in thorough preparation to meet and stamp out the disease. He spoke of the vast importance of the earliest possible treatment of a case and believed in the acid treatment.

Dr. W. B. Atkinson, Secretary of the American Medical Association, spoke of the action of the Pennsylvania State Board of Health last fall. They put themselves in communication with all the Health Inspectors of the State. They inspected all immigrants from their entrance into the State. The railroads acceded to their requests in reference to suggestions made by the Board for carrying immigrants. They are now fully prepared for the re-appearance of cholera.

Dr. Edward O. Shakespeare, of Philadelphia, was then introduced, and after speaking of his appreciation of the manner in which Dr. Baldwin had opened the discussion, he dwelt upon anti-choleraic inoculation. He recognized the claims of Ferran; he stood alone among the official commissioners who went to Spain to investigate. In reference to quarantine, he did not believe that the United States could be protected by local quarantine. The Local Boards are too much under maritime and trade interests to give proper attention to this question, and therefore that system is inefficient. Then there is no uniformity under local management, even if the laws are uniform, and we could not escape having a wide variation in knowledge and practice of the members of the Boards, especially where political influence enters. It is utterly impossible that independent Boards could perfect and carry out their plans without enormous expenditure of money, New York, probably, being the only port that has sufficient commerce to bear such an expenditure. Then there is a jealousy in these quarantine establishments as to outside suggestions or investigations. He proceeded, therefore, to argue in favor of a National quarantine.

Dr. Ezra M. Hunt, Secretary of the State Board of Health, having been announced to discuss this question, and finding that his health and other duties would not permit, sent a communication, which he began by saying: "As I am in the habit of keeping appointments, I feel that I must write a few lines in the place of closing the discussion on cholera, as I had agreed to do." After expressing regret at not hearing Dr. Baldwin and others on the subject, he apologized for speaking in an off-hand, informal way and "somewhat in disregard of scientific theories or of popular medical views as to the treatment of the disease," he proceeded to speak of the purely practical sanitary question of *how to prevent a first case* of cholera from giving rise to others. No time is to be wasted in talk as to whether the comma bacillus or spirillum, *per se*, causes the disease. We had better fall back upon the general proposition that we are dealing with a particulate contagium which arrives from without, which is chiefly, if not entirely, propagated by the secretions from a patient, notably those of the intestinal tract, and which spreads by "*indirect infection*" to susceptible persons and susceptible localities. In preparation and prevention our special duty is to minimize and prevent *susceptible localities.* That fully means such cleanliness of houses and their surroundings as is only secured by enforced sanitary administration, and by its intelligent co-operative support by physicians and a fair proportion of well-informed citizens. It costs money, but, as Sir John Simon puts it: "It is important for the public very distinctly to remember that pains taken and costs incurred for the purposes to which this refers cannot in any event be wasted. The local conditions which would enable cholera, if imported, to spread its infection in this country, are conditions which, day by day, in the absence of cholera, foster and spread other diseases—diseases which are never absent from the country, and are, in the long run, far more destructive than cholera. Hence the sanitary improvements which would justify a sense of security against any apprehended importation of cholera would, to their extent, though cholera should never re-appear, give amply remunerative results in the prevention of those other diseases."

Dr. Hunt then congratulates our people that the State government has made it possible for every municipality and every township in this State to adopt all ordinances needed, and for the governing bodies of every city and township to provide the necessary funds.

(Dr. Hunt might have added that the State Board of Health has not failed to acquaint every Local Board with its duties and privileges under the laws, and to provide abundant literature of information, direction and advice.—D. C. E.)

If, as is the case, some Boards fail of their duty, "sin lieth at the door." Some day as to cholera, or some less exciting pestilence, if neglect continues, "be sure your sin will find you out."

Dr. Hunt then considered the question of the protection of persons, and emphasized cleanliness of the individual. It is the greatest of blessings, and more than quarantine, when each immigrant has a warm bath, and all of his clothing a steam bath also. Hard as is the problem, it is toward an ideal of personal cleanliness that the sanitarian, who would protect the individual from infection, must ever be working.

He then dwelt upon the two specialties as to cholera:

First. In times of cholera, every stomach and bowel disturbance must receive the promptest attention. If at that time it is not incipient cholera, it is a condition favorable to a start of the disease, and so a dose of restraining medicine, a recumbent position, a mustard plaster and a physician are to be sought for quicker than under ordinary circumstances.

Second. So soon as a case is known or suspected to be cholera, the physician, the health officer, the nurse or some one must take strict possession of patient, of room, of discharges, of everything that appertains to patient and room, for isolation and disinfection. The failure is generally here, and it is a failure of discipline and minuteness in details, and in seeing to, or knowing of their being carried out. Repeating these details is not necessary here. They are well known, or at least there is no excuse in this State for any Health Board not knowing.

Dr. Hunt argued that on these two specifications rests the whole question as to the prevention of spread of a cholera invasion so far as we can control it. Of course, we do not forget the patient, or the primal duty of the physician and others to him, although we purposely here avoided direction as to treatment. He, too, is concerned in most of these preventive measures. At any rate, it is to those that have to do with the patient that we have to look for organized efficiency in preventing the spread of the disease.

Dr. Hunt states that in addition to circulars already issued by the State Board of Health, he had ready for this year's report a condensed statement of the directions given by the German and English Government Boards and by our own highest authorities, with remarks appended. He urged physicians and others to speak freely through the press of any neglects or of any slipshod administration, and said that the greatest difficulty in the event of an epidemic would be to get good nurses. He suggested that our hospitals should prepare for this and other sickness by inviting a list of those willing to serve, and of whose capacity they could assure themselves. The State Board was willing to give all the help they can, but the whole policy of our health administration is to give ample powers to Local Boards, to furnish them with the best information on all sanitary topics, to advise as to what shall be done in any given instance, but, with the exception of control over transportation, to hold the locality responsible for administrative acts.

THE CAUSE AND PREVENTION OF DIPHTHERIA.

The remaining subject on the programme was "The Cause and Prevention of Diphtheria," by Daniel Strock, M.D., of Camden. Dr. Stock commenced with a reference to the efforts by Pasteur, Klebs and Loeffler, whose investigations had demonstrated the fact that micro-organisms were the cause of morbid processes in the animal body and had isolated a bacillus which is now the recognized agent in the production of diphtheria. He then referred to the investigations of Prof. Prudden and Dr. Park, of New York, the former having made bacteriological examinations in 24 fatal cases of pseudo-membraneous inflammations of the tonsils, pharynx and larynx, in all of which the Klebs-Loeffler bacillus was absent, and in all but two streptococci were found. Park reported 159 similar cases, of which in only 54 were the baccilli found; in the remaining 105 were found streptococci in abundance. Boginsky, Kolisko, Sevestre, Wurz, Bourges and others are quoted as finding streptococci without the bacillus in pseudo-membraneous inflammation occurring in scarlet fever. He argued that while we may question whether the cases without the Klebs-Loeffler bacillus are true diphtheria, they are infectious, and we should clinically make no distinction as to precautionary measures, while scientifically, we should endeavor to differentiate by the use of the microscope and culture media. He then referred to the laws governing the propagation and growth of the bacillus; its prolonged life, the disease being conveyed in clothing, in sewers, in water and in milk; agar-tube cultures after seven months' growth are still alive, &c.; that the germ will perpetuate its species under varying conditions of soil and environment, while the circumstances dominating its development are not so clear. It is assumed by the Doctor that there are certain positive conditions necessary for its growth and continued existence, and he argued that to claim that its presence in a given locality is accidental, or that because of unsanitary environment, by a process of rapid evolution a harmless germ is transferred into one with pathogenic attributes; or that by a special creative act it is caused to be where it did not exist before, are untenable theories. While the laws governing the origin and perpetuation of the bacillus diphtheria cannot be definitely formulated, we do know that filthy and unsanitary conditions are co-existent with outbreaks of diphtheria, and moisture, ordinary temperature and absence of sunlight and pure air are important factors in developing endemics and epidemics of this disease. Various theories as to the causation of the outbreaks of diphtheria were then considered by Dr. Strock.

Its prevalence in communities after the appearance of one or two cases is due to the fact that it is contagious and infectious. Personal contact is dwelt upon by the writer. Localities may be centers of infection for a year or more if not radically disinfected. A case is cited of a house that was vacated the day following the funeral of a child dying from diphtheria; it remained unoccupied for one year. It was then taken by a family, and in three weeks thereafter a child of that family died of diphtheria. Public, private and Sabbath-schools are argued as the most potent agents in causing the spread of the disease in communities. Some interesting cases were cited where Dr. Strock traced cases to the school-house for their origin. Its dissemination through milk and water was discussed and the great importance of guarding the milk and water-supply from contamination was strongly urged. The Doctor then argues that the discovery of its bacillary origin simplifies the problem of preventing diphtheria, for if the germ is destroyed we remove the cause. Reference is made to the various antiseptics or bacteriocides. After referring to isolation and care of the patients, cleansing and disinfecting bedding, clothing, premises and attendants, &c., he considered some of the questions of public policy in managing diphtheria; domiciliary quarantine in connection with the hardships it entails upon the occupants not affected with the disease and the question of compensation on account of previous dereliction on the part of the health authorities.

Where isolation cannot be carried out, removal to hospitals provided for this class of contagious diseases was adopted. Supervision of the schools was also urged.

During the prevalence of diphtheria the public schools should be closed, the infant classes of Sunday-schools especially, for these are the greatest factors in the spread of this disease. The vacating of houses after deaths from diphtheria, and the re-renting by another family without thorough disinfection of the house and of the effects of the family vacating was another method of spreading the disease. The Health Board should prevent this. The Health Inspector should, on receipt of notice of diphtheria in a house, give personal supervision to the disinfection of the premises immediately. It should be impressed upon all who have to deal with this disease that prophylaxis is the true and perhaps the only sure way of combating diphtheria.

Dr. English read a letter from President-elect Grover Cleveland, who had been sojourning in Lakewood and was invited to attend, regretting that a multitude of cares and occupations in New York prevented his acceptance.

The Committee on Nominations reported, and the officers elected for the ensuing year are as follows:

President—Carrol P. Bassett, C.E., Newark.

First Vice President—Hon. Addison B. Poland, State Supterintendent of Public Instruction.

Second Vice President—David C. English, M.D., New Brunswick.

Recording Secretary—A. Clark Hunt, M.D., Metuchen.

Corresponding Secretary—Prof. J. M. Watson, Elizabeth.

Treasurer—George W. Howell, C.E., Morristown.

EXECUTIVE COUNCIL.

(With the above-named officers.)

Shippen Wallace, Ph.D., *Chairman*	Burlington.
Isaac Hull Platt, M D.	Lakewood.
Charles B. Brush, C.E.	Hoboken.
J. C. Smock, Ph.D., State Geologist	Trenton.
Judge J. A. McGrath	Jersey City.
Rev. Samuel Lockwood, Ph.D.	Freehold.
Prof. C. H. Raymond, Ph.D.	Lawrenceville.
Henry R. Baldwin, M.D.	New Brunswick.
Judge Wm. M. Lanning	Trenton.
James Owen, C.E.	Montclair.
Prof. H. B. Cornwall, Ph.D.	Princeton.
Prof. W. N. Barringer	Newark.
Prof. A. R. Leeds, Ph.D.	Hoboken.
William Elmer, M.D.	Trenton.
Prof. C. M. Davis	Bayonne City.
David Harvey, Counselor-at-Law	Asbury Park.
W. G. Hoopes, Esq.	Atlantic City.
William Pierson, M.D.	Orange.
William H. Hall, M.D.	Lakewood.
E. S. Atwater, Counselor-at-Law	Elizabeth.
Daniel Strock, M.D.	Camden.
Joseph H. Powell, Esq.	Bridgeton.
James A. Exton, M.D.	Arlington.
T. R. Chambers, M.D.	East Orange.
John L. Leal, M.D.	Paterson.
H. Brewster Willis, Counselor-at-Law	New Brunswick.
Geo. W. Rockfellow, Esq.	Plainfield.
Arnold H. Moses, Architect	Merchantville.

President Bassett was then introduced.

An invitation was extended to the Association to hold the next annual meeting in Atlantic City. It was favorably received with thanks, but referred to the Executive Council with power.

The following Committee on Legislation was appointed:

L. B. Ward, C.E., Jersey City; William I. Lewis, Esq., Paterson; Judge J. A. McGrath, Jersey City; Judge W. M. Lanning, Trenton; John S. Westcott, Esq., Atlantic City.

Resolutions of thanks were then extended to the Local Committee, Dr. Isaac H. Platt, W. J. Harrison, Esq., and Geo. P. Olcott, C.E., for providing so pleasantly and satisfactorily for the convenience and comfort of the members; to the proprietors of the Laurel House for their considerate attention to the needs and entertainment of the Association, and to the guests who had materially aided us.

SUMMARY OF REPORTS FROM LOCAL BOARDS,

AND LISTS OF MEMBERS AND HEALTH INSPECTORS, WITH ABSTRACTS FROM MOST OF THE REPORTS.

In October in each year, as required by law, a printed schedule of inquiries is sent to each Local Board of Health, also containing a blank for the names and post-office address of members of Local Boards and Sanitary Inspectors. The following is the schedule:

SUBJECTS FOR REPORTS.

A. Location, population and climate.
B. Geology, topography and contour.
C. Water-supply.
D. Drainage and sewerage.
E. Streets and public grounds.
F. Houses and their tenancy.
G. Modes of lighting.
H. Refuse and excreta (how managed).
I. Markets.
J. Diseases of animals.
K. Slaughter-houses and abattoirs.
L. Manufactories and trades.
M. Schools and school and other public buildings.
N. Alms-houses, hospitals and other charities.
O. Police and prisons.
P. Fire guards or escapes.
Q. Cemeteries and burial.
R. Public health laws and regulations.
S. Registration and vital statistics.
T. Quarantine, or care over contagious diseases and vaccination.
U. Sanitary expenses.
V. Heat and ventilation for dwellings.
W. Prevalent diseases of the year.

Other subjects may be named under X, Y, Z. The subjects may thus be referred to by the letters.

If the sheet provided is not sufficient, add others, marked with the letters which designate the topics treated.

If details on some of the subjects named have been furnished in former reports, these do not need to be repeated. But each item should be carefully examined, and full information given under R. It is always best to state what the Board has actually done. Under W no disease should be reported as having been prevalent, unless the writer knows of at least ten cases during the whole year. The medical member of the Board should, if possible, give facts as to any epidemic that has occurred, and should note any special needs or defects in sanitary administration. (See Book of Circulars and Inspectors' Guide.) Board meetings are held as needed, and monthly meetings are not obligatory.

During the past year the threatening of cholera necessitated increased activity in many Boards, and with a view to ascertaining just the action that had been taken, the "Memorandum as to Cholera" was sent with each report blank. It will be found in full under the heading, "Circulars and Laws," in this report.

REPORTS OF LOCAL BOARDS OF HEALTH BY TOWNSHIPS AND COUNTIES.

AS SUMMARIZED AND ARRANGED BY A. CLARK HUNT, M.D.

ATLANTIC COUNTY.

ABSECON TOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George B. Lutts, Japhet Adams, James Townsend, Towers Townsend, Joseph Madura, Clayton L. Higbee, E. H. Madden, M.D. Post-office address of all, Absecon.

ATLANTIC CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Borton, President; Henry S. Scull, Julius Coty, William B. Loudenslager, William G. Hoopes, Jr.; Jacob H. Leedom, Treasurer; M. D. Youngman, M.D., Secretary; A. T. Glenn, Health Inspector; Patrick Hughes and John C. Risley, Assistant Inspectors; A. T. Glenn, Jr., Clerk. Post office address of all, Atlantic City.

The water-supply is from artesian wells 1,300 feet deep (Consumers Company), and from springs on the mainland seven miles distant (Atlantic City Water Works Company), both private companies. Very few persons depend now on cisterns. Water is of good quality and ample in quantity, has no organic matter, is soft and free from discoloration. Surface-water wells are not allowed by the Board.

During the past year the sewerage system has been much improved, the terra-cotta pipes being replaced by 12 and 15-inch iron pipes. The fall per 100 feet varies from 8 to 15 inches.

Houses have no basements or cellars below the surface of the ground. There are no tenement-houses. Yearly inspections, house-to-house, are made, and the Board keeps at its office a record of the condition of all properties, in which the properties are marked "Fair," "Good," "Entirely satisfactory" or "Bad." There is a system of surface drainage, consisting of iron pipes and wooden trunks at street crossings, and some few lines of wooden trunks to carry surface-water to throughfare. The city is year after year improving this surface system.

Our records show that of the 3,500 buildings within the city's limits there are 2,000 connected with the sewerage system, and the connections are constantly going on at the rate of about fifteen per month. Those premises not connected with the sewers have water-tight brick vaults, as required by our code, and are cleaned by odorless excavators, only those licensed by the Board being allowed to engage in this work.

On June 16th, 1892, the Board passed an amendment to Section 1, Article XXIV., of the Code, which section as amended now reads: "That any person or persons violating any of the provisions of any section of this code, or where reference is made to this section wherein the penalty is not provided for, shall forfeit and pay a penalty of ten (10) dollars for every such offense, and in case of a continuing offense shall be liable to a further penalty of five (5) dollars per day after the expiration of the time limited in the written notice from this Board." And a special notice printed in red ink, of large type, is inclosed with each and every notice given by the Inspector, that no one may plead ignorance of this law. Suit has been instituted and judgment recovered in several cases under this section of the code.

There have been remarkably few contagious or infectious diseases during the year, those occurring being for the most part visitors temporarily sojourning in the city. Immediate report is required from the attending physician, a convenient blank being furnished all physicians for that purpose. The form is as follows:

ATLANTIC CITY, N. J.,..............................189

....Health Inspector:

Name... Age................ Sex...............

Parent (or guardian)...

Residence ....

Has ....

Due notice will be given when convalescence is complete.

Number of other children in family attending school.......................................

....M.D.

☞ ARTICLE IV.—CONTAGIOUS AND INFECTIOUS DISEASES.

SECTION 1. Any physician or any other person knowing of or attending a case of small-pox, cholera, yellow fever, typhus fever, typhoid fever, scarlet fever, measles or diphtheria shall immediately notify the Health Inspector. * * * Every violation of any part of the foregoing section shall be punished by a fine and costs of suit, as provided in Article XXIV., Section 1.
[*Sanitary Code of Atlantic City.*]

All cases receive prompt inspection. All precautions in the way of disinfection and isolation are at once taken, and upon the receipt of notice from the attending physician that the case is convalescent, thorough fumigation is performed by the Board's Inspector.

During the past year the Board has secured the filling of many low lots and the connection of many houses with the sewerage system; secured the filling of many alleys; employed during the summer season a special Inspector for the ocean front to prevent the deposit of rubbish, garbage, and other unsanitary matter along the ocean front, under the board walk, and the booths and buildings adjacent thereto. This Inspector was clothed by the Mayor with police authority and arrested any one found in the act of creating a nuisance of any kind. Great satisfaction and commendation was expressed by our citizens and visitors upon this course of the Board, and it will probably be repeated hereafter each season. The Board has under construction a quarantine hospital, a two-story-and-a-half building of eight rooms, two rooms especially fitted for patients, open fireplaces in each and provided with bath-room and bath, which when complete will have cost the Board $2,000. The lot upon which this building stands is 137x400 feet; it is situated at the extreme limit of the city. The Board is a most effective organization and is indorsed by the citizens generally; the members are interested, enthusiastic and determined to maintain the most perfect sanitary condition for our city. Meetings are held weekly during the months of May, June, July, August and September, and every two weeks during the remaining months. The meetings are well attended, the whole Board usually being present. The office of the Board, which is permanently located in the City Hall Building, is open from 8 A. M. to 6 P. M. daily, and a clerk is in charge the entire day to receive complaints and attend to the affairs of the Board.

M. D. YOUNGMAN, M.D.,
Secretary.

BUENA VISTA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dominick Corseglia, Buena Vista; Edward G. Schmickel, Folson; George B. Cake, Buena Vista; Douglas Reed, Buena Vista; C. W. Jones, Assessor, Richland.

There have been no prevalent diseases in the township this year. Our climate and soil are exceedingly healthy and there is but little necessity for sanitary regulation or official interference. Nothing more has been done than that the Township Committee has organized as a Board of Health.

C. W. JONES.

BRIGANTINE BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alfred B. Smith, Constant Bowen, John Strickland, David Lawrence, Josiah Smith. Post-office address of all, Brigantine.

The above are the Councilmen. No regular Board of Health.

EGG HARBOR CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George F. Breder, William Mueller, Lawrence Berchtold, Henry G. Regensburg, Valentine P. Hofmann, Secretary. Post-office address of all, Egg Harbor City.

The Common Council passed an ordinance on February 20th, 1892, for a better supply of water. A number of citizens obtained an injunction to test the validity of the same; no decision thereon has been given.

The common public drain has at last been thoroughly cleansed, insuring a good drainage of the surplus waters.

One case each of diphtheria and measles was reported last March; the patients recovered.

Some minor cases of nuisances were reported, examined by the Nuisance Committee, and by them abated.

On May 9th, 1892, an ordinance was passed "To prevent the spread of dangerous epidemics or contagious diseases in Egg Harbor City, and to maintain and enforce a proper and sufficient quarantine."

The Board held regularly monthly meetings on the Monday preceding the first Wednesday of each month, and also a number of special meetings.

The necessary precautions were issued to the public in reference to the threatened cholera epidemic, and the Board took measures to secure an isolated dwelling for the care of the patients.

V. P. HOFMANN,
Secretary.

EGG HARBOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John C. Fifield, Bakersville; John I. Corson, Bargaintown; Samuel A. Smith, English Creek; Samuel C. Edmonds, M.D., Linwood; William H. Leeds, Bakersville.

Location, south corner of Atlantic county; 2,500 population; mild climate. Dug wells used. No particular disease among animals except hog cholera. Five school-houses; two life-saving stations. County alms-house is situated in this township. There are four cemeteries connected with churches, and one incorporated.

The Board of Health met and organized on March 12th, 1892, and then met at such times as are specified by law.

The Board held a special meeting on September 28th, 1892, to examine the method of handling and using garbage. They found that the one complained of had complied with all the requirements of the Sanitary Code, and had not created any nuisance.

W. H. LEEDS,
Secretary.

GALLOWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Hanselman, President, Cologne; Joseph M. Collins, Port Republic; Isaac Strickland, Oceanville; Sherman De Mill, Medical Member, Oceanville; A. H. Higbee, Secretary, Leeds Point.

Organized and adopted a Sanitary Code and printed 500 copies in pamphlet form for distribution. Location, east part of Atlantic county, bordering on Atlantic Ocean; population, about 2,200 by last census; climate, very good. Brick and driven wells are used; generally soft and pure water. Cellars mostly dry; malaria almost unknown. No sewers. No slaughter-houses. Schools are in good sanitary condition. There are six cemeteries, all properly kept. Have made no special preparations for cholera.

A. H. HIGBEE,
Secretary.

HAMILTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James W. Blarsdell, J. V. Beckett, Thomas Kears, Charles S. Abbott, Mulford C. Hoover, Lewis W. Cranmer. H. C. James, M.D., Health Inspector. Post-office address of all, Mays Landing.

Since my last report the Board has adopted a new Health Code. Regular meetings have been held once every month the last year, and the meetings have been productive of some good results. The sanitary condition of the township has been uniformly good, and the public health well maintained. No prevalent diseases during the year, with the exception of la grippe, which prevailed during the winter months, the number of cases far exceeding those of the two previous winters. During the past summer there have been fewer cases of dysentery and intestinal troubles in children than in any of the five previous summers.

H. C. JAMES, M.D.,
Health Inspector.

HAMMONTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. J. Smith, S. C Newcomb, S. Holland, James Seeley. Edward North, M.D , Health Inspector. Post-office address of all, Hammonton.

The water-supply is entirely from wells. Many of our people have driven wells. The supply is more sure, as they are not affected by drought. There is no danger of contamination of the water, as there is in open wells. There are twenty-five wind-mills in the town used for pumping water. There is no system of drainage or sewerage. The buildings are not close enough together to require it. The soil is sandy, and there is no water stands to get stagnant and cause trouble. The houses all have large lots or farms, except a few in the center of the town. With the exception of our Italian population, one family occupies a house. The Italians live a family in a room. With the exception of the coldest weather, they live, cook and eat out of doors. Refuse is collected once or twice a year and burned. Excreta is composted and used as a fertilizer.

There have been no diseases among the animals of the town, at least no contagious disease. There is but one slaughter-house in town, and that is kept in as good a condition as is possible.

We have just completed a large school-house, at a cost of eighteen thousand dollars, with an improved heating and ventilating system. The other school-houses in the town, of which there are five, are in a good sanitary condition.

Our Board of Health adopted the Health Code recommended by the State Board, and enforce it as far as possible. Should any contagious disease (or epidemic of it) appear in the town, the Board could quarantine it and keep it under control. All the physicians of the town have been requested by the Health Inspector to report contagious disease to him, and he has done all in his power to prevent any spread of it. So far we have had no severe epidemic. The last of 1891 and the first of 1892 we had some la grippe, but not as many cases as the two years before. There have been several cases of scarlet fever, measles and mumps. At the present time we are having a great many cases of whooping-cough. I do not know of a case of typhoid fever in the last year.

Our Board held meetings according to law. There were no complaints made to the Board. We have had no regular house-to-house inspection. As Health Inspector, I make it a rule to inspect all houses where I visit, and keep a general lookout through the whole town. Whereever I find any unsanitary conditions I advise a change, and in all cases so far, the people seem willing to accept my suggestions, so that it is unnecessary to go to the expense of a house-to-house inspection. The sanitary condition and health of Hammonton are excellent.

EDWARD NORTH, M.D.,
Health Inspector.

LINWOOD BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Israel G. Adams, Mayor; John D. Sanders, Reuben Somers, George Meyers, Jr., James Somers, John B. Williams, Joseph T. Haines. Post-office address of all, Linwood.

The Board is not regularly organized, but is under a Sanitary Committee of Council.

MULLICA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Saalmann, Egg Harbor City; Reuben Brooker, Elwood; W. B. Oliver, Pleasant Mills.

JOHN T. IRVING,
Township Clerk, Elwood.

PLEASANTVILLE BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jonathan Martin, President; Isaac Andrews, Secretary; Richard I. Risley, Isaac Collins, Richard Risley, Richard M. Sooy, M.D., Lewis H. Barrett. Dr. R. M. Sooy, Health Inspector. Post-office address of all, Pleasantville.

Pleasantville was formerly part of the upper end of Egg Harbor township. In 1889 a borough was formed, containing four square miles and about 1,800 inhabitants. It is situated on the mainland five miles northwest of Atlantic City, with an unbroken stretch of salt-marsh between. The lower border of the southeast line of the borough is on Lake's bay. The climate is much the same as that of Atlantic City. It has a sandy soil with hills and beds of gravel here and there, about one-half or three-fourth mile from the shore line. The surface is level with a gradual slope to the meadows. Our water-supply is derived entirely from surface wells, and is of good quality. There is no system of drainage or sewerage employed; all is left to nature. Our streets are surfaced with gravel. We have no public grounds. We have no tenement-houses, except for one or two small families. There are no means of lighting except with ordinary lamps burning oil. There is no amount of refuse or excreta except what each family makes and which is disposed of by the same according to the code. We have only two small markets, such as are found usually in villages. We have been free this year from disease among animals. Heretofore numbers of swine had cholera, but this year there have but few if any had it. Our schools are well looked after and kept repaired, heathful and clean. We have three schools with eight teachers. We have five churches, but no other public buildings. Two churches have each a cemetery attached and Atlantic City has one in the borough on the line of the West Jersey railroad. The health of the public is generally very good. We have no miasmatic diseases originating here, and have had no epidemics of diseases that are contagious or infectious, except such as are common to childhood. Each year there are a few typhoid cases of a mild type, which were imported or traced to the well in use by the person. We have been very free this year, owing probably to the dry season. Heat is supplied from stoves burning either coal or wood. Some have hot-air furnaces; a few, hot water. Our Board has been attentive to duty and this year framed and passed a new code, dealing very stringently with the use of garbage. The garbage is made in Atlantic City and some of our farmers procure it for food for swine and some for fertilizer. The code is so strict as to be nearly prohibitive. Less is being used every year and only a few tons have been brought in this year to be used as a fertilizer, and only a few swine have been fed on it within the borough. No complaints have come to the notice of the Local Board this year. The code deals with all the questions of quarantine, vital statistics, &c., and each member is on the alert to see that its provisions are complied with. The members of the Board are selected from different sections of the borough, so that anything calling for their services is quickly noticed. As to the cholera, we are situated about the same as are other villages like this. There are no special provisions yet made for the care of such cases, but there could very soon be, and cases properly cared for and the public protected.

R. M. SOOY, M.D.,
Inspector.

BOROUGH OF SOMERS POINT.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George H. Cook, A. F. Kappella, Mark S Somers, William H. Keates, H. H. Vansant, Henry Notheker. Post-office address of all, Somers Point.

Somers Point, situated on the west side of Great Egg Harbor inlet, bay and river; population 400; 1,600 acres. Water from spring wells, soft and clear; drainage, surface. No malaria and no swamps near by. Houses with cellars; used for storage. No two tenement-houses for families. Cesspools half cement and half surface. No slaughter-houses; one school-house. Canvas fire-escapes to hotels. Two cemeteries. No quarantine necessary at present. Stoves and heaters for heating purposes. In case of cholera we have a vacant house, also a nurse who would take charge of a case. Sanitary condition satisfactory, and the Board has not met lately.

N. D. VAUGHAN,
Clerk.

WEYMOUTH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Anthony Parker, Sr., Tuckahoe; Anderson Campbell, Tuckahoe; Anderson Bourgeois, Estellville; W. H. Campbell, Secretary, Scullville.

Wells and stream. Drainage is good, flowing to Egg Harbor, Tuckahoe and Middle rivers. Frame buildings, and very few contain more than one family. There are four school-houses in the township; two are in good condition, the others not so very. The people have in one district raised money to improve its sanitary condition. The Secretary of Local Board acts as Health Inspector. The drainage has been improved, but very little else. The township is very thinly settled, and has nothing to create filth. The Local Board stands ready to protect the township in case of an epidemic.

BERGEN COUNTY.

BOILING SPRINGS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James Van Roden, Rutherford; James P. Edwards, Rutherford; George W. Sturges, Jr. (Secretary), Rutherford; Wm. McKenzie, Carlton Hill; M. Tygert, M.D., Carlstadt.

Bounded on the south by Union township, on the north by Lodi township, on the east by the Hackensack river, on the west by the Passaic river. Climate comparatively mild.

Soil consists mostly of sand-loam and salt-marshes.

Water-supply from the Hackensack Water Company (a private company); also from wells and cisterns. The supply from the Hackensack Water Company was introduced about one year ago, and is used by about one-third of the inhabitants, and so far is very satisfactory. The water is never discolored, has no disagreeable taste or odor, and is soft and seems to be about uniform during the entire year. As yet, we have not procured a list of houses using the public water-supply.

We have no sewers. Drainage mostly surface, and, with the exception of a few instances, quite satisfactory. We will undoubtedly have a sewerage system in the near future.

Streets are being macadamized, curbed and guttered. There are no public grounds.

Most houses have cellars, very few basements. There are undoubtedly many cellars used for storing vegetables. but the most of them are in a fair sanitary condition. We have a few tenement-houses of more than one family. There is no systematic house-to house inspection, but the above-mentioned tenement-houses, together with certain other questionable localities, receive quite frequent, thorough inspection.

Kerosene oil used mostly for lighting purposes, but will soon have both gas and electricity.

There are only a few houses having cesspools, and they are not cemented. The contents are generally removed by a sanitary company.

There are no slaughter-houses or abattoirs in this township.

The Board of Health passed ordinances about one year ago.

There are no alms-houses or prisons.

The schools are all in a good sanitary condition.

The township is generally in a very thorough sanitary condition. The Board has had occasion only twice during the past year to issue public notices—once advising general vaccination, and once during the recent threatened invasion of cholera, advising thorough disinfection and cleansing of premises. There was a light epidemic of scarlet fever, of moderate severity, during the past year, but, by isolation and thorough disinfection, it was soon brought under control. There were no other prevailing contagious diseases.

M. Tygert, M.D.,
Inspector.

ENGLEWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Abram Tallman, Hardy M. Banks, M.D., James Harris, Henry J. Brinkerhoff; M. E. Springer, Secretary. Hugh Smith, Health Inspector. Post-office address of all, Englewood.

Streets are lighted by gas supplied by the Bergen County Gas Light Company, and by gasoline lamps; houses, stores, churches, halls, &c., by gas and kerosene oil lamps.

No vegetable refuse or waste matter allowed to remain exposed upon the surface of the ground, it being either burned or carted away and buried. As to excreta, many of the houses are connected with the sewer of the Citizens Sewage Company, the mains of which are being extended every year; but where outside vaults and cesspools exist, they are kept under strict supervision by the Board of Health, and are emptied when necessary, by odorless vault-cleaning apparatus, contents removed and buried.

Meat, fish and vegetable markets are of the best order, and are kept thoroughly clean, no waste or refuse matter being allowed to remain on or about the premises.

There has been no animal disease this year so far as known.

No slaughter-houses or abattoirs.

No manufactories. The building trades are the most important, and are very active.

Four public district schools in the township: Districts Numbers 7, 8, 9, 10. No. 7 being situate within the village of Englewood, is a large, well-equipped, graded school, heated by steam, capable of accommodating 600 pupils, and has a corps of 10 teachers; it has also a branch school under the Palisade cliffs, under the supervision of same School Board. Beside these, we have three flourishing private schools, all well organized and equipped, under the care of proficient instructors, where pupils are fitted for college.

We have one hospital, supported by voluntary contributions of the people, supplied with a good corps of experienced nurses, medical advisers, and every convenience for caring for the sick or disabled. It was organized in 1889, and has been the means of doing a great amount of good.

Besides the above, the Local Board of Health has recently had erected, on the outskirts of the village, in an isolated position, yet sufficiently near to be easily accessible, a frame building capable of accommodating 12 beds, with two separate rooms for nurses, and two bath-rooms, fitted up with all the necessary appliances, for use in cases of cholera or other contagious diseases.

Cemeteries are well kept, and all the laws in relation to them strictly observed.

The public health for the past year has been generally good; a few cases of scarlet fever and diphtheria, and one case of typhoid fever, occurred during the summer months, but they were promptly reported and carefully looked after, premises fumigated and so thoroughly guarded that no serious outbreak has occurred, and at the present time there are, so far as known, no cases of contagious disease in the township.

The Board of Health meets regularly every month, at which time the Health Inspector reports in full as to the sanitary condition of the town, and such action is taken as may be necessary, following said report.

A local record is now being kept by the Board of Health, of marriages, births and deaths, and causes of death, and the collecting reports from physicians and midwives is being carefully looked after.

So far as can be ascertained, most of our buildings are heated, ventilated, and furnished with plumbing in the most approved manner, and with a careful observance of sanitary laws and regulations.

M. E. SPRINGER,
Assessor.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Uriah Quackenbush, Wyckoff; Peter S. Winters, Wyckoff; George C. Demarest, Oakland. John W. Ackerman, Assessor, Oakland. E. W. Hamilton, Health Inspector, Oakland.

The water-supply is principally from wells and cisterns. We have but one small slaughter-house in the township and it is kept quite clean with the use of disinfectants. Our Board met on September 20th, 1892. This meeting was held on account of the cholera fright. The Inspector was instructed to quarantine all premises and station a guard over same in case of cholera. Otherwise our Board has had no cause to act since last spring, then we had four cases of scarlet fever and one of diphtheria. All the premises were thoroughly fumigated by the Inspector. There is nothing more to report.

JOHN W. ACKERMAN,
Assessor.

HARRINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. N. Durie, Secretary, Closter; Richard B. Haring, Tappan; John H. Lindemann, Closter; Lewis B. Parsell, M.D., Closter.

The water-supply is from wells and is generally abundant and of excellent quality. At present, owing to the prolonged drought, some of the wells are dry and all are very low.

There is no system of drainage or sewerage. The cellars are usually dry, except in the lower parts of the village during the wet season.

The houses generally have cellars. Some few have basements, which are partly used as kitchens and dining-rooms and partly as cellars. There are no large tenement-houses, and only one house is at present occupied by more than two families. There is no yearly house-to-house inspection.

Refuse and excreta are disposed of by means of cesspools and water-closets. The cesspools generally are built with open bottoms and sides, and also the privy-vaults. They are emptied when they become full or offensive. The contents are usually carried out into a field and mixed with soil-plaster and ashes and used as a fertilizer by the farmers.

The past year has been an unusually healthy one. There have been a few scattered cases of diphtheria, scarlet fever and measles, but no epidemic of any kind.

No special action has been taken by the Board during the year. The regular meetings have been held and several complaints have been made of foul-smelling waste-pipes and drains, and the owners of the property were at once notified to have them put in proper condition.

We have no special provisions for cholera patients, and no special action has been taken in reference to cholera. Should cases occur, they would be taken care of at their homes.

LEWIS B. PARSELL, M.D.

HOHOKUS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. H. Murray, Ramseys; Charles Young, Ramseys; Joseph Terwilleger, Ramseys; Wm. Wilson, Allendale; John Ackerman, Ramseys; Charles P. Devoe, M.D, Ramseys.

Report same as last year. We have had eleven cases of scarlet fever during the past year, but it did not become epidemic. We have no provisions for cholera. Have not had a meeting of the Health Board during the past year.

WM. H. MURRAY,
Assessor.

LODI TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Ullman, Carlstadt; John Burke, Lodi; Francis Feitner, Carlstadt; John Van Bussum, Hasbrouck Heights. Dr. Richter, Health Inspector, Carlstadt.

The water-supply is largely from wells and cisterns. The Hackensack Water Company have extended their pipes through Hasbrouck Heights. Most of the residents are using this water. Also through

Woodridge, where it is used by many, and through Carlstadt, where it is coming into favor. Of this source of supply there is no complaint.

There is no general sewerage. The cellars are dry. A system of drainage, under the direction of the Board of Health, is being completed in the meadow adjoining the New Jersey and New York railroad. Houses generally occupied by their owners. Basements the exception. Cellars used for the storage of vegetables. Refuse and excreta used to fertilize the soil.

There has been no disease prevalent among animals. No slaughter-houses or abattoirs. There are no new manufactories, and no complaints of nuisance from those now existing. There are three cemeteries.

The Board of Health has made every effort to do its duty. The vital statistics have been carefully collected and returned.

In the early summer there was an alarm of small-pox, but less than ten cases were reported. In several suspected cases the disease proved to be measles and chicken-pox. All the people in the township were ordered vaccinated. Several convenient places were appointed for that purpose.

The older buildings are generally heated by stoves and ventilated in a primitive manner. The newer ones are supplied with furnaces and ventilated by modern methods.

There has been no prevalent disease; no cases of cholera, and none suspected. The Board of Health has a general supervision over the health of the township, trying to remove all known cause of disease, and to prevent the spread of contagion when single cases of that character have occurred.

JOHN VAN BUSSUM,
Secretary.

MIDLAND TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John G. Zabriskie, President, Rochelle Park; Albert J. Bogert, River Edge; Casper T. Zabriskie, Ridgewood; Nicholas G. Hopper, Secretary, Ridgewood. W. L. Vroom, M.D., Ridgewood, Health Inspector.

The Board organized and appointed a day for the hearing of complaints. The general health of the township has been remarkably good. No disease of a prevalent or dangerous nature has existed with the exception of one case of small-pox, brought from Hackensack and taken to the pest-house at the county alms-house, which is situated in Midland township. All necessary precautions were taken to prevent the disease from spreading, which proved successful and the patient recovered. The Board has not passed ordinances.

NICHOLAS G. HOPPER,
Secretary.

NEW BARBADOES TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Andrew Diedrich, President; Richard P. Paulison, Edward Schmults; G. Howard McFadden, M.D., Health Inspector; Fernando Vreeland.

Our township has been very free from epidemics of all kinds during the year past. There have been but few complaints made to our Board, and those were of a trivial nature and soon abated after the Inspector's examination. Our schools are in good sanitary condition. Privy-vaults have been cleaned and disinfected. The drinking-water is good, and the buildings are all well ventilated. The children have been very free from contagious diseases. During the late cholera scare the ditches and cesspools were all examined, and those that were in a foul condition were properly cleaned.

As to provision for contagious diseases in our township, we have none; we have for the past ten or fifteen years been free from all such; have had but one case of small-pox, and that was removed to the county pest-house.

FERNANDO VREELAND,
Secretary.

HACKENSACK.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. C. S. Wells, President; D. G. Jeffers, Secretary; B. B. Barkman, Treasurer; C. F. Adams, M D.; F. H. White, M.D.; L. Perrot, C. Conklin; M. W. Heath, Health Inspector; R. Ballagh, Plumbing and Drainage Inspector. Post-office address of all, Hackensack.

The public health laws and regulations have been generally observed. Our Health Inspector has been very diligent in abating nuisances. A thorough inspection was made during the summer months, with results which reflect creditably on the observance of the health laws.

The activity in building operations made imperative the appointment of an additional Inspector to look after the ordinance regulating the plumbing and drainage of buildings.

The health report of Hackensack is very good. The number of contagious diseases during the year was as follows: Scarlet fever, 10; diphtheria, 3; small-pox, 1. The case of small-pox was contracted out of town, and the patient was removed to the county pest-house, and received the attention of the Board and recovered.

The usual complaints received the prompt attention of the Board.

D. G. JEFFERS,
Secretary.

ORVIL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. O. Blinis, Saddle River; O. W. Jennings, Saddle River; E. D. Leary, Hohokus; A. H. Ackerman, Assessor, Saddle River; Charles W. Badeau, M.D., Allendale.

There is nothing to report different from last year.

A. H. ACKERMAN,
Assessor.

PALISADE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. J. Haring, M D., President, Tenafly; A. Jarvis, Tenafly; Théo. L. MacIntyre, Tenafly; D. D. Blauvelt, Schraalenburgh; J. B. Christie, River Edge.

The Board of Health for the township of Palisade was reorganized early in the year.

There has been little occasion for official action.

General conditions conducive to health have been existent during the year.

No epidemics have prevailed in the township. Malarial disorders have been rare, as compared with former years.

Very few cases of sickness of any nature have come under the observation of the Board that were traceable to local causes.

The probability of the introduction of cholera within the jurisdiction of the Board has seemed so small as not to warrant official action. Had occasion arisen, there would have been prompt and vigorous action.

Attention has been called to a few cesspools, and action taken.

The absence of a drainage system in the village portions of the township gives added importance to the subject.

The Health Board has also interposed in the matter of polluting running streams of water.

Our favorable conditions and surroundings justify this brief report.

J. J. Haring, M.D.

RIDGEFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John S. Eadsall, Palisade Park; Albert Revekes, Ridgefield Park; Joseph Schlosser, Fort Lee; Thomas F. Mallon, Secretary, Nordhoff. Dr. Joseph Huger, Health Inspector, Fort Lee.

The health of this township during the past year has been very good. Disease of a malarial type has been on the decrease. We have had three cases of small-pox, one proving fatal; also, a slight epidemic of scarlet fever complicated with diphtheria. In those cases above mentioned the Local Board had the houses so affected quarantined and all precautions taken to isolate where it was discovered.

Thomas F. Mallon,
Secretary.

RIDGEWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

M. T. Richardson, President, Ridgewood; A. G. Hopper, Health Inspector, Ridgewood; E. Nickerson, Treasurer, Ridgewood; Thomas Terhune, Secretary, Hohokus. Dr. J. T. De Mund, Medical Inspector, Ridgewood.

There is nothing special to report from Ridgewood township. The principal work of the Board has been to impress on the people the importance of observing sanitary rules in cases of cholera. The Board has sent Circular 45 to each family in the township, recommending them to make themselves familiar with its contents, and to preserve it carefully for future reference.

Thomas Terhune,
Secretary.

RUTHERFORD BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. H. Hollister, President; J. C. Sares, S. N. Higbie, M. E. Fake, Chas. Burrows; Cornelius Collins, Inspector; Chas. E. Tolhurd, Secretary. Post-office address of all, Rutherford.

Located between Hackensack and Passaic rivers, in Northern New Jersey. Population about 3,000. Water-mains furnished by Hackensack Water Company. Sewers now building; drainage to both rivers good. Houses nearly all owned by occupants.

Three school buildings; in good sanitary condition. Health Code has been passed.

All instances of contagious diseases are carefully watched, and thus far Rutherford has been very free from such diseases. A system of sewerage has been commenced, but at present there is nothing to report in that connection.

CHAS. E. TOLHURD,
Secretary.

SADDLE RIVER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry A. Hopper, Fair Lawn; Peter Alyea, Dundee Lake; Albert Conklin, Garfield; Isaac A. Hopper, Fair Lawn.

Location of township, northwestern part of State; population, about 3,500; climate, medium; water-supply, wells; drainage, none; streets, ordinary; no public grounds; houses, fair; modes of lighting, kerosene mostly; refuse and excreta are removed by the odorless machines; there are two manufactories.

The schools are in very good condition. There are three cemeteries; two are kept in good condition, one not so good, which is a Jewish cemetery. Vital statistics are sent to me from all parts of the township and returned to Trenton on the 15th of each month. Heat and ventilation are about the same as in all country districts. The Board has met twice, once to organize and once to prevent Passaic authorities from conveying their small-pox patients through the town of Garfield. The city of Passaic had quite a few patients at one time last summer. Our township is in about as good and healthy condition as ever in my recollection.

ISAAC A. HOPPER,
Secretary.

UNION TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Kehoe, Lyndhurst; Charles F. Harrington, Lyndhurst; Wallace Taylor, Kingsland; Alex. J. Davison, Kingsland. Dr. Wm. E. Trautwein, Health Inspector.

There is nothing to add to the former report. The health of the township is generally good; no prevalent diseases. The Board has adopted a Health Code, which imposes a fine of ten dollars on all nuisances that are not abated inside of ten days. The Health Inspector has gone around the village and had all the water-closets cleaned.

ALEX. J. DAVISON,
Secretary.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Garret Hering, President, Hillsdale; Daniel O'Mara, Westwood; John H. Ackerman, Woodcliff; Dr. S. J. Zabriskie, Westwood; John G. H. Knoner, Secretary, Westwood.

Washington township is one of the northern tier of townships adjoining Rockland county, N. Y. Permanent population about 3,000, which is considerably increased during the summer months, perhaps to the number of 500, by boarders and summer residents. The climate is temperate, with less extremes of heat or cold than nearby localities, owing to its moderate elevation, sheltered location and proximity to the sea.

It belongs to the red sandstone regions, and is traversed northwesterly and southeasterly by gentle ridges of inconsiderable height, every foot of which is used and adapted for farming and residential purposes. The corresponding valleys between these ridges are generally well drained by rapid-flowing streams.

The water-supply is entirely furnished by wells, but few springs being found or used.

No artificial drainage has been introduced into the township, the houses, even in the villages, being surrounded by more or less of kitchen garden, which receives the waste of the houses.

All offensive matter is, generally speaking, used for manurial purposes.

I have not heard of a single case of any contagious disease among animals.

The few manufactories in our township are small, and give no grounds for complaint on account of anything unhealthful connected with them.

This year has been quite an eventful one as regards schools, and especially school-houses. There have been two new districts formed and new improved school-houses built. In one other district the citizens have entirely moved and improved their house; whilst in another an addition for a third class-room has been built. We have now seven school-houses within our township. All, with the exception of one, have proper water-closet facilities and good wells on the school-house grounds.

Our two cemeteries are well managed.

I believe that the returns of vital statistics are very nearly complete. I have only found two cases of neglect in birth returns, and these were owing to the ignorance of the parents about the requirement of the law.

Beside a moderate amount of the grip in the spring months, there have been a few cases of scarlet fever, of which two children died on the same day in one household, and in another house all the inmates recovered. This was brought directly from New York.

Our Board formally organized on May 26th, 1892, with five members. At the same meeting, June 13th, from two o'clock to seven P. M., was set to hear complaints, and notice was given in the township paper. A code of ordinances was passed to its third reading, and notice thereof duly given in the same newspaper. On June 13th, three of the members were present between the hours specified. No complaints were made. The Board took up the code, and it was adopted and published for two weeks in the township newspaper. A motion was made and adopted to publish 500 copies in pamphlet form for free distribution.

I may state that the only two cases where action might be desirable are the standing of manure cars on the track in the heart of Westwood village (waiting to be unloaded), and the Rivervale School, where the outhouses adjoin and form a part of the school-house. This latter the District Clerk has promised to alter and remedy.

As to contagious or infectious diseases, our three resident physicians use all proper care to prevent their spreading.

JOHN G. H. KNONER,
Secretary.

BURLINGTON COUNTY.

BASS RIVER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. E. French, Levi French, James E. Cramer, C. Garrabrant, M.D.; M. W. Adams, Assessor. Post-office address of all, New Gretna.

Southern part of Burlington county, New Jersey; population, 900; climate, temperate; loamy soil near coast, but quite sandy in the upper part of township.

Bass River township, and New Gretna, its principal town, lie between Bass and Wading rivers, with the Mullica river on the south. Next to each of the above rivers is marshy land, which, during severe easterly storms, is covered by tides; gradually rising toward the upland, striking a loamy soil; continuing to rise, and becoming quite hilly in the northern part. Water obtained from dug and driven wells from 12 to 35 feet. Natural drainage, sloping toward the above rivers. Streets well graded, and sidewalks and shade trees being gradually introduced. No public grounds. Five school buildings in township. Four cemeteries, and burials are private when diseases are contagious. Vigilance in the observation of the laws of health is observed.

CITY OF BEVERLY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. J. J. Currie, Chairman; Dr. B. F. Soby, Clerk; Hugh B. Ely, Geo. A. Smith, Wm. K. Vansciver, Jos. L. Simon, Chas., F. Richardson. C. F. Richardson, Health Inspector. Post-office address of all, Beverly.

The Board has held nineteen meetings, at six of which it lacked a quorum. Meetings have been called monthly, and semi-monthly in the summer.

In October last, the State Inspector was called to examine the mode of disposal of drainage from a hosiery mill which some had objected to on account of odor, &c. His suggestions met with approval, and no complaints have since been made.

Some cases of diphtheria continued to cause anxiety, and in December a resolution was passed directing the Inspector to quarantine infected houses, placing public notices thereon stating the disease, which notices were not to be removed except by him. Public funerals were also strictly prohibited where death was caused by any such disease.

In May, notices were posted prohibiting the depositing of garbage in public places, open lots, &c., in the city limits.

The question of improved water-supply was also discussed, and a conference held with the officials of the water company, but it was not shown that any better mode of obtaining the water for the works could be found as long as it was taken from the river, analysis showing that it was very doubtful if any disease was traceable to the use of the river water.

In September, in view of the probable visitation from cholera, a notice was issued which was placed in every house in the city by the City Marshal, with copies of State Board circular relating to cholera. Fortunately, no cases at all resembling cholera have come to the knowledge of the Board, while a general house-cleaning and premises, generally, put in better sanitary order, have been the result.

Physicians have been quite prompt in reporting any contagious diseases, which have been comparatively few. A more prompt reporting of births would be desirable to enable the records to be kept up more accurately. The Board has had rumors of some cases where births are not reported as promptly as desirable, but has not pushed the investigation.

The general health is fairly good. Diphtheria and scarlet fever have occurred in a few cases, but not nearly so prevalent as last year. At this writing there are three houses now under quarantine for scarlet fever, all of which are reported as light cases.

The Board is glad to say that there is a general desire to comply with requests made, and a disposition to uphold it in its efforts for promoting public health. Its chief difficulty is to convince some as to whose duty it is to keep gutters, &c., free from such impurities as would develop disease, but no legal action has been necessary to enforce any requirements made. A note from the Inspector has generally resulted in the removal of the cause of complaint.

Some public system for removal of household refuse is essential, and it is hoped the authorities will take up this question and make proper arrangements before next summer.

C. F. RICHARDSON,
Inspector.

BEVERLY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John G. Hippenstiel, Delanco; Louis R. Hibberd, Edgewater Park; Charles E. Russ, Beverly; H. K. Weiler, M.D., Inspector, Delanco; Joseph B. Carter, Secretary, Delanco.

The Board has held regular stated meetings during the year. The Inspector has made a house-to-house inspection during the past two months, and has abated such existing nuisances as were thought detrimental to health. No epidemic or contagious diseases have been prevalent in our township during the year, and the general health of the inhabitants and condition of their premises have been good.

JOSEPH B. CARTER,
Secretary.

BORDENTOWN CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Clinton Mendenhall, D. R. Brown, Dr. William H. Shipps, Hugh Newell, Dr. I. D. Young, F. G. Wiese, Joseph Vansant. H. N. Jobes, Health Inspector. Post-office address of all, Bordentown.

As year succeeds year, the work of an active health organization increases rather than diminishes, and the year just closed has proved no exception to the rule, as applied to the Local Board of Health of this city. A number of knotty problems have been dealt with; some of which have been satisfactorily settled, while others still remain in process of adjustment. Hardly had the year fairly opened, when we were confronted by the accidental discovery of several cases of small-pox in a house almost in the center of the city. Investigation showed that on or about December 25th, 1891, one of a family of twelve persons was taken sick with what was supposed to be la grippe. No physician was summoned at the time. After the lapse of a few days a male relative visited the family, and at once diagnosed the case small-pox. This, he stated to the writer, he was competent to do by reason of the fact that at one time he had had considerable experience as a nurse in a hospital for contagious diseases. By his advice the family agreed to keep secret the nature of the disease. This was done to escape publicity and in order that their liberty might not be interfered with. In the space of five or six weeks, four more members of the family were stricken with the disease, two of the cases being of the confluent form of the disease. Fortunately all recovered. When the cases were first discovered by the health authorities, convalescence was well established. Immediately, prompt sanitary measures were enforced; all ingress and egress from the premises prohibited until well assured that the danger of further spread of the disease had passed. In addition, the Board of Health urged upon the citizens the necessity of a general re-vaccination, and as a further inducement employed a staff of physicians to do the work gratuitously for all persons who felt unable to bear the expense. As a result very many persons availed themselves of the opportunity offered. No further spread of the disease occurred.

In my report of a year ago, mention was made of an epidemic of diphtheria prevailing in Bordentown; since said report was prepared we have been called to deal with an extended epidemic of the disease, not a second epidemic, but rather a rekindling of the first. No local cause can be assigned for the disease. Since December 1st, 1891, to the present time, there have been reported some two hundred cases of the disease, with a mortality of about 14 per cent. In the writer's opinion the continuance of the disease in our midst is traceable to the first case, occurring in June, 1891, on the outskirts of the city, all subsequent cases being due to contagion, or the conveyance of the disease from one person to another, either by direct contact or through the medium of clothing, furniture, &c. The Board of Health has used every endeavor to stamp out the disease, and yet it still exists. Twice the public schools of the city were closed, each time being followed by a prompt abatement of the disease.

No better method of propagating the disease can be suggested than that afforded by the grouping together day after day of large numbers of children in imperfectly-ventilated class-rooms, many of whom, consciously or unconsciously, come direct from homes already contaminated by the disease. In the writer's own experience during the past year, in more than one instance, children have come from the school-room to his office with the diphtheritic patches well marked upon their fauces. It is not to be wondered at that contagious disease becomes epidemic where such danger exists. Add to all this, we are unfortunate enough to possess a public school building that, from a sanitary standpoint, is unfit for the purpose for which it is used, its architectural construction being such as to provide no adequate provision for light, heat or ventilation. In making this statement it is with the hope that the attention of the State authorities may be directed to the subject.

During the year no new sewers have been laid; those we have in use are without means of flushing, ventilation or trapping, and consequently they but imperfectly fulfill the purpose for which they were constructed. The Board of Health has repeatedly urged Councils to employ the services of a competent sanitary engineer, and have him prepare a plan of sewerage for the city such as modern scientific methods indorse as calculated to give the best results from a sanitary and economic standpoint; but aside from arguing with the Board that the idea is a good one, no steps have been taken to improve upon old methods.

The cholera scare reached Bordentown in common with other localities. In anticipation of its approach a house-to-house inspection was ordered and a general cleaning up recommended. To encourage this the city authorities agreed to remove free of cost, for a given period, all rubbish, ashes or other refuse accumulated in yards or cellars. Many took advantage of the offer. Sanitary literature was distributed from time to time and the citizens advised as to the proper precautions to be taken. Fortunately we were not compelled to face the foe. Nevertheless the warning given was productive of much good in the shape of greater cleanliness and stricter attention to sanitary details.

Among the unsettled problems is the question of a safer source of water-supply. Notwithstanding the fact that the stream from whence we obtain our supply of drinking-water is contaminated to a degree not previously known, recent chemical analyses show the water to be fully up to the standard allowed for wholesome drinking-water. This presents an unanswerable argument to many. Nevertheless, unless our knowledge of the evil effects of sewage pollution be founded upon most erroneous principles, the continued use of water thus polluted must inevitably be followed by consequences injurious to health. Until this is a demonstrable fact the prospects of any change in our sources of supply are most remote.

Our Board of Health is composed of men enthusiastic upon the subject of public health, and willing to give freely of their time and influence to the work of sanitary reform.

WILLIAM H. SHIPPS,
Secretary.

BURLINGTON CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Frank Carter, President; Dr. J. S. Adams, Secretary; Dr. Walter E. Hall, Alfred Platt, A. H. McNeal. Post office address of all, Burlington.

The Secretary states that there has been an entire re-organization of the Health Board recently, and that he is not able to make a report of last year's work.

BURLINGTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas Uptin, George Weatheril, Ezra B. Marter, Jr.; E. Mount, Assessor. Post-office address of all, Burlington.

CHESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Perkins, Samuel S. Dager, John Warick, John S. Rogers; John R. Mason, Assessor; F. G. Stroud, M.D., Health Inspector. Post-office address of all, Moorestown.

The township has been remarkably free from any prevalent disease this year, and there have been no losses more than common among animals. The Board of Health of the township organized in June, and have held one meeting since. There were one or two complaints that were promptly attended to.

JOHN S. ROGERS,
Secretary.

CHESTERFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles B. Holloway, Chesterfield; T. W. Ridgway, Chesterfield; G. H. Warner, Chesterfield; John F. Rogers, Crosswicks.

Water-supply principally from wells. Drainage, but no sewerage in the township; cellars mostly dry. No swamps of any size; no malaria. No house-to-house inspection because of no complaints. Very few cesspools cemented; most all open bottom; contents cleaned annually and used on land. Diphtheria, twenty-five cases, months of May and June; ten deaths from same.

G. H. WARNER,
Chairman.

CINNAMINSON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward H. Ogden, Riverton; Isaac Evaul, Palmyra; William R. Lippincott, Cinnaminson; Timothy Morton, Parry; Dr. Marcy, Riverton.

Public water-suppply by private company; about 150 houses take it; water is never discolored, has no iron or other taste, is neither hard nor soft and never bad. A great many depend on wells. The Health Board has no list of water-takers or those who depend on wells. The water supplied by the company is as fine as can be had anywhere.

There is one sewer in the township, on Main street in Riverton; it is very satisfactory to those who use it. Cellars are invariably dry.

There is very little malaria. The health of our township has been unusually good during the year. Typhoid fever has not been seen. No epidemics of any sort. A great many children attend the public schools without having been vaccinated. The Board has been trying to overcome this practice. The fault lies with the teachers and Trustees.

Our Board is going to pass ordinances, and when we do there ought to be a Sanitary Inspector. The Board has tried to acquaint the people with facts as related to filth and disease, and has urged them to keep their premises in good condition, and they have in the main observed our admonitions.

ALEX. MARCY, JR.,
Secretary.

DELRAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles G. Robeson, A. E. Conrow, M.V.D., Thomas Fairbrother; Edward J. Yearly, Assessor; Thomas S. Lippincott, M.D., Medical Member. Post-office address of all, Riverside.

Delran township, in Burlington county, situated at the junction of the Delaware river and Rancocas creek, contains over 5,000 acres, and includes the towns of Riverside, Bridgeboro and Fairview and Cambridge. Population near 3,000. All depend on wells for the supply of water. Cesspools are mostly open bottom and sides. Contents are emptied mostly by the occupants and spread over the surface of gardens and farms. All houses have good, dry cellars, which are used more or less for the storage of vegetables. Slaughter-houses and other places have been inspected. Two new factories have been added to our town during the last year. Nuisances from old factories have been abated. All accumulations of rubbish and other deleterious matter have been removed wherever found. Numerous sunken pools of stagnant water have been remedied, also drains laid where necessary to carry off foul liquids to places of safety. The excreta of several places have been removed to farms and used for fertilizing purposes. No contagious diseases among animals. A large number of ordinances have been passed respecting nuisances, &c. The public health is properly cared for by the Local Board of Health, and our people appreciate the same.

T. S. LIPPINCOTT, M.D.

EASTAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. G. Hatcher, Smithville; R. G. Hall, Smithville; Joseph Engle, Jr., Smithville; I. Uncles, Smithville; George W. Vanderveer, M.D., Mount Holly.

The Board of Health of Eastampton township has held such meetings as are appointed by law and begs leave to report that the township is in good sanitary condition.

EVESHAM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John J. Mitchel, Richard H. Leeds, Boman S. Lippincott, P. V. B. Stroud, M.D. William L. Brown, Assessor. Post-office address of all, Marlton.

Report of the Board of Health of the township of Evesham is nothing of any importance different from former reports. Families are supplied with water by wells, generally good.

Cellars have water in in the spring of the year or unusually wet times. No swamps of any extent.

The Assessor has not heard of any contagious disease among animals.

Two slaughter-houses in the township; they are kept in reasonably good condition, and not considered a nuisance.

William L. Brown,
Assessor.

FIELDSBORO.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. V. Carter, William Leatherbury, John Mealy, Thomas Hamilton, Samuel Kelly.

We are looking well after the health of the borough. Have no contagious diseases and very little sickness of any kind.

William Leatherbury,
Secretary.

FLORENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Campbell, President; John Kale, Earl Gray; John Peacock, Secretary; David Baird, Jr., M.D. Post-office address of all, Florence.

Situated on the Delaware river midway between Bordentown and Burlington, with a very nice location. Its population is about 1,900. Its water-supply is from wells and the water is very good. Drainage and sewerage are in bad condition. Streets and public grounds are in fair condition. Some houses are in good and others in bad condition. A few years ago about all the inhabitants were vaccinated. An epidemic of scarlet fever and diphtheria occurred during the winter, but the summer has been quite healthy. In case we had persons suffering with cholera, we have no place to put them.

LUMBERTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Philip Haines, Lumberton; J. Odenheimer, Lumberton; Albert Middleton, Hainesport; W. C. Parry, M.D., Hainesport; Edwin Rogers, Secretary, Masonville.

No contagious diseases. No special organization.

MANSFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Sharp, John R. Naylor, A. N. Dobbins, E. A. Ingling. Post-office address of all, Columbus.

There has been nothing done the past year, and the Board has not organized. I think we ought to have an Inspector, and think the Board should organize. I have called attention to the matter several times.

EDWIN A. INGLING,
Assessor.

MEDFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. H. Kirkbride, Henry L. Garwood, J. Reeve, Benj. Wilkins. Post-office address of all, Medford.

Surface drainage; many cellars damp in wet weather. No sewers. Cesspools usually not cemented; contents carted away and buried. La grippe in December, January and February; measles very prevalent in March, April and May.

MOUNT LAUREL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Andrews, Fellowship; Charles Sordon, Mount Laurel; Samuel B. Lippincott, Stanwick.

We have no report to make, no business of any kind whatever having been brought to our notice.

JOSEPH K. MATLACK,
Assessor.

NEW HANOVER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Benjamin Remine, Wrightstown; Miller H. Cross, Ellisdale; L. D. Woodward, Cookstown; Martin V. Pullen, Cookstown. Amos D. Shour, Health Inspector, Jacobstown.

The hog cholera has existed in this township during the summer months. About one thousand hogs and pigs have died during the year 1892.

NORTHAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Isaac Huff, Secretary; Robert L. Nixon, John Longstreet, Thomas Niffins. R. H. Parsons, M.D., Inspector. Post-office address of all, Mount Holly.

The water-supply is taken from the Rancocas creek, and is furnished by a private company. The stream receives no drainage above the town's point of supply. The water is soft but very much discolored.

The reservoirs are cleaned twice a year. We have a system of drainage with a public sewer, which has already been described. We have an ordinance regulating the cleaning of cesspools. The slaughter-houses have been inspected and are now in good condition.

Our public school-house here is entirely too small, and during the winter is overcrowded; it is a very old building, and the rooms have no provision for ventilation.

The general health of the town has been good. There were a number of diphtheria cases in the early part of the year.

The Board meets regularly twice a month.

PEMBERTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. S. Budd, Pemberton; Andrew Fort, Pemberton; Ivins Davis, Pemberton; John N. Smith, Brown's Mills.

RANDOLPH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. C. Adams, Lower Bank; William A. Maxwell, Wading River; Thomas Holloway, Harrisia; J. E. Carey, M.D., Lower Bank.

Report same as last year.

WILLIAM JOHNSON,
Assessor.

SHAMONG TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Winfield S. Haines, Assessor, Tabernacle; Charles De Cou, Tabernacle; George W. Haines, Tabernacle; Henry Taylor, Indian Mills.

Shamong township is in Burlington county, about midway between the Delaware river and Atlantic Ocean, on the southern boundary of the county, or Atsion river. Its population is between 900 and 1,000. Its climate is very changeable.

Its water-supply is excellent; there are streams running through the township of pure cedar-swamp water, and the wells are mostly good, with never-failing springs.

The houses are mostly good, and their surroundings and tenancy, I think, are above the average.

There are five school-houses in the township, and they are all in good condition, with the exception of the Atsion district.

Cemeteries, &c., are kept in a good condition, but are rather close to houses, especially the one at Tabernacle, but not to cause any inconvenience. The public health is, as a general thing, good.

Collection of vital statistics is not satisfactory, on account of the neglectfulness of the doctors practicing in this township.

There was a bad outbreak of diphtheria last fall, of which five persons died out of one family, but it did not get to any other family only in a mild form. There is no doctor living in this township.

WINFIELD S. HAINES,
Assessor.

SOUTHAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel F. Kelley, Charles L. Rogers, John W. Haines, John C. Brown, M. D., Charles G. Naylor. Post-office address of all, Vincentown.

The Board has had no occasion to meet this year at all.

CHAS. G. NAYLOR,
Assessor.

SPRINGFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Stockton, Jobstown; Samuel Emmons, Jobstown; Isaiah G. King, Jacksonville; Dr. Van Mater, Columbus; A. B. Evans, Jobstown.

The township of Springfield has been very healthy, there being no diseases, only such as a few cases of ordinary diseases that generally occur in all townships. The township is well drained and the water is of the finest quality.

ALBERT B. EVANS,
Assessor.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Albert S. Sooy, Fred. Miners, A. L. Birdsall. A. E. Koster, Health Inspector. Post-office address of all, Green Bank.

There have been a few cases of scarlet fever and diphtheria during the past year. Precautionary measures were taken to prevent the spread of the diseases and the township is now in a healthy condition.

A. E. Koster,
Assessor.

WESTAMPTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. Shannon Haines, Rancocas; C. F. Gaskill, Rancocas; Furman Dubell, Mount Holly; Joseph H. Bowne, Mount Holly.

No report to make.

WILLINGBORO TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Leeds, Rancocas; Oliver Parry, Beverly; Samuel Stokes, Beverly; J. M. Stokes, Rancocas.

WOODLAND TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel Lee, Shamong; Charles H. Pitman, Mount Relief; John A. Bozarth, Vincentown.

There is nothing new to report.

Patrick Rowe,
Assessor.

CAMDEN COUNTY.

CAMDEN CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Frank H. Burdsall, President, 411 North Fifth street; Allen C. Wood, 440 Line street; George F. Hammond, 18 South Third street; Charles Watson, 432 Federal street; Wm. S. Mosslander, M.D., 837 Penn street; Benjamin S. Lewis, M D., 701 Pine street; George R. Fortiner, M.D., 517 Cooper street. Eugene B. Roberts, Health Inspector.

Our water-supply is mainly from the Delaware river, and under control of the city; the reservoirs and pipes have been thoroughly cleaned within the last month, and as previously reported to the State Board of Health, fully four-fifths of the houses are supplied with city water.

In regard to drainage and sewerage, we are now engaged in a thorough investigation of the subject. The relative merits of terra-cotta and iron pipe for house drainage are being investigated by the Board. A regulation of the Local Sanitary Code provides that house drains shall be constructed of iron pipe through the building to a point six feet beyond the foundation walls, from which point connection is permitted to be made to the sewer by means of terracotta pipe. The Board has interpreted this law to apply to area and alley-ways, and has prohibited the laying of terra-cotta drains within six feet of foundation walls upon any side of building. We have found upon investigation that perfectly-closed joints cannot be made with terra-cotta pipe, but can be secured by iron pipe. Therefore to reduce the tendency to percolation through the subsoil of waste material from the house we have insisted upon the use of iron pipe. The cellars, with few exceptions, are dry. There are a few low lots, which are being rapidly filled up.

Nearly all houses have cellars; very few basements occupied; no tenement-houses. No yearly house-to-house inspection.

The city has an aggregate length of 37 miles of sewers, and all properties abutting the same are compelled to connect therewith. During the past year eight hundred houses have been connected to sewers, the records so showing.

No prevailing diseases among animals last year. We keep no record of animals.

All slaughter-houses are regularly inspected and kept in good condition.

In this city there are 19 schools and a number of public buildings, all of which are fitted up with the latest sanitary improvements.

We have one hospital and two dispensaries, and two homes for friendless children, all well-managed institutions.

There are five cemeteries in the city limits.

Vital statistics are carefully collected and recorded.

All contagious diseases are taken care of by the Medical Inspector and quarantined if necessary. Our city has been free from any serious outbreak of contagious diseases. Typhoid fever, scarlet fever and diphtheria have been the most prevalent, but have not at any time during the year assumed alarming proportions. There have been 862 cases of the above-named diseases reported to the Board during the year ending October 1st, 1892. Of this number, 131 died. The usual sanitary regulations, properly enforced, have been sufficient.

The Board has held regular monthly meetings, and special meetings when necessary, and has kept a sharp lookout over the city's sanitary condition; and nuisances, as soon as found or reported, have been abated. During the year we have created the office of Nuisance Inspector. We are now equipped with efficient and active officers, who cover thoroughly all departments of public sanitary work. The work is divided into the following branches: Medical, Plumbing and Nuisance Inspectors.

CENTRE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Ezra C. Bell, Westville; John D. Glover, Mount Ephraim; George H. Thomas, Haddonfield; J. H. Jackson, Haddonfield; William B. Jennings, Haddonfield.

The health of our township has been good. The prevalent diseases during the past year have been influenza, catarrhal affections of the upper air-passages, diarrhœa, dysentery, mumps and whooping-cough. The cases of dysentery were of a mild type. No cases of typhoid fever have occurred, and very little malaria. There have been no cases of diseases in animals reported to the Board.

We have held but one regular meeting since organization, but we have held frequent conferences as to the best methods of maintaining good sanitary conditions.

As to the cholera, we have made no special arrangements, as we were informed that we need not fear as to its outbreak in our midst, owing to the land of our township being high and generally healthy.

We have been watching closely new-comers whom we suspected might bring it among us.

We have also given much attention to the matter of diseases in animals since the outbreak of the Texas cattle fever, and we hope by your aid and hearty co-operation to keep our township in a good sanitary condition.

J. H. JACKSON,
Secretary.

DELAWARE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John A. Meredith, Haddonfield; Wm. T. Lippincott, Moorestown; Samuel T. Matlack, Haddonfield; Wm. Graff, Ellisburg. W. B. Jennings, M.D, Haddonfield, Health Inspector.

The-water supply is from wells, with a few springs. The only drainage is the natural slope of the land. The houses nearly all have cellars. There are no basements. The cellars are largely used for storing vegetables. Cesspools are used exclusively and are not cemented. The contents are emptied once or twice a year and spread over the land or buried. No diseases of animals have come under the notice of the Board. The school-houses are in good sanitary condition. The only cemetery is kept in first-class condition. There are no dwelling-houses near it. We have passed ordinances. The prevalent diseases have been influenza and its consequences, catarrhal affections of the respiratory organs, dysentery of a mild type and diarrhœa. The Board has met at each meeting of the Township Committee. We have appointed an Inspector and have carefully looked after and abated nuisances.

GLOUCESTER CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Duncan W. Blake, Henry M. Harley, Edward J. Steer, John W. Warner, Patrick Mealey, John C. Stinson; Daniel F. Lane, Secretary. Dr. John J. Haley, Health Inspector. Post-office address of all, Gloucester City.

Our water department, on advice of the Board of Health, is sinking artesian wells to supply our inhabitants with pure and wholesome water, and by next summer we expect to have the system in perfect order. Eight-tenths of all water is from water works. Our drainage all empties into Delaware river, as also our sewers. Most of our sewers are laid with open bottoms, and in a number of cases where houses had water in cellars it drained them all off. There is some low land in our city limits where malaria was frequent. Our Board has now served notice on owners of said property to drain their lands off; they having refused to comply, the city is about to proceed against them according to law. This year we have built about 1,600 feet of sewers, making about four miles of sewers in city. The ventilation is through perforated manhole covers. All houses have cellars. Our Inspector is making a house-to-house inspection. City is thoroughly lighted by electricity. Our Board, as a sanitary measure, has served notice on a large number of property-owners (where they consider it necessary to public health) to connect with sewers. All cesspools now built are, by order of Board, cemented. There have been about thirty cases of scarlet fever in our city since last report. There is one slaughter-house in city and it has been inspected and put in good sanitary condition. I would state that at our last meeting of the Board the Sanitary Committee and Inspector were directed to make a thorough inspection of the whole city and employ all necessary help and disinfectants to put the city in a thorough sanitary condition.

DAN'L F. LANE,
Secretary.

GLOUCESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Brewer, Chew's Landing; Joshua B. Sickler, Chew's Landing; Charles Jenkins, Kirkwood; Robert Jagard, Clementon; Wm. J. Brown, Assessor, Kirkwood; Jos. E. Hurff, M D., Blackwood

The sanitary condition of Gloucester township is good. There have been no complaints made to the Board of Health this year. Our public school-houses, almshouse, asylum, are all in a good healthy condition. The county buildings have sewerage, which empties into a stream. The township has good natural drainage. Drinking-water is obtained from wells. Refuse from cesspools is generally buried or plowed under by the farmers. There have been no epidemics. The Board of Health is well organized and ready for any emergency that might arise. Have made no arrangements for cholera; being located out in the country, did not deem it needful.

WM. J. BROWN,
Secretary.

HADDON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. T. Collings, Collingswood; John Stoy, Westmont; Samuel Wood, Haddonfield; George T. Haines, Haddonfield, Secretary. Wm. B. Jennings, Haddonfield, Health Inspector.

The water-supply in the country is from wells, and in Collingswood a majority have wells. A public water works, owned by a private company, has been started in Collingswood within the last six months, deriving its water from an artesian well. About thirty houses already use it; slightly discolored at times; soft. It is a fact that water from the wells that have been dug in Collingswood has been, by reason of a stratum of marl, discolored, and had a bad smell and taste for the first six months, after which time it becomes all right.

No system of sewerage in township. No prevalent disease of animals. Slaughter-houses are inspected; no trouble with them. Schools in good sanitary condition. We have ordinances governing the township.

A number of physicians, as well as some who have charge of marriage returns, are very slow in making returns.

The only cases of contagious disease coming under the notice of the Board of Health were a few cases of scarlet fever, which were strictly isolated and thoroughly disinfected. The prevalent diseases have been influenza and the diseases arising therefrom, scarlet fever, catarrhal affections of upper air-passages, dysentery and diarrhœa. Malaria has occurred only in the low lands along creeks.

We have held monthly meetings and been on the lookout, but have found comparatively little requiring attention.

GEO. T. HAINES,
Secretary.

MERCHANTVILLE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. D. H. Bartine, Dr. J. W. Marcy, A. H. Moses, W. B. Stewart. Henry L. Perret, Fred. W. Kleinz, Health Inspectors.

Located in Pensauken township, Camden county, four miles northeast from Camden, 99 feet above high-water mark, lying upon a ridge of sandy soil, of an average of one mile in width, gradually descending, to the north toward the Delaware river, to south and east to Cooper's Creek valley. Soil a sandy loam and porous, a substratum of marl, running from 12 to 20 feet deep. Some wells, with an average depth of 16 feet; some cisterns, and the principal supply from reservoir of spring-water, at a distance of two miles from the town, conducted through pipes to the town. From biennial examinations of water from reservoir it has been found to be of excellent quality. Sewerage emptied into cesspools, made in accordance to instructions of the Board of Health. Houses well separated, with large surroundings, and usually but one family to a dwelling. Three private schools and one public school, one public hall, all in good sanitary condition. Public health has been generally very good; no epidemics of contagious diseases. The few cases that occurred were carefully quarantined, thereby preventing any spread. La grippe very prevalent during the months of January and February. No other diseases specially epidemic. A complete re-organization of Board, and first meeting held September 9th, 1892, since which time it has been very active on account of a possible visitation of cholera. A few cases of contagious diseases have occurred, such as scarlet fever, diphtheria and measles, but by proper care have not been allowed to spread beyond primary cases.

D. H. Bartine, M.D.,
President.

PENSAUKEN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Mercer, Pensauken; Samuel Mosely, Delair; George H. Amon, Cramer Hill; H. E. Horner, Merchantville.

STOCKTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles W. Scott, Joseph Whitacar, Dr. Jerome Arts. Harry G. Vennell, Health Inspector. Post office address of all, Cramer Hill.

WATERFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. W. Bennett, Berlin; Jacob L. Bate, Berlin; William Haines, Marlton. Crawford W. Githens, Assessor.

We have all that is required in a case of cholera. The drainage is good. The prevailing disease this year was la grippe, in February. This neighborhood is called a healthy one, as we are on the highest point between the Delaware river and the Atlantic ocean. Our water-supply is from wells and generally good. Houses are frame and mostly occupied by owners. Cesspools are usually cleaned twice a year. Have one slaughter-house, but in good condition. Our school-houses are all new and in first-class condition. Our Board has not been called out to abate any nuisance or for any other cause. Upon the whole, we consider it very healthy.

C. W. GITHENS,
Assessor.

WINSLOW TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry M. Jewett, President, Winslow; M. G. Burdsall, Secretary, Wilton; Firman M. Peacock, Wilton; Charles Albright, Elm.

Situated in the southern part of Camden county. Population, 2,450. Water-supply from wells principally. No sewers; natural drainage. No prevalent diseases this year. No slaughter-houses. Our Board has met, organized, and passed ordinances, abated one nuisance, ordered several water-closets cleaned, &c.

CAPE MAY COUNTY.

ANGLESEA.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Ludlam, President; Geo. W. Dougherty, Secretary and Treasurer; Gus. Nelson, Bernard Long. Post-office address of all, Anglesea.

Anglesea, situated on Five-Mile beach, topographically is a series of sand-hills and intervening slashes or marshes, which, in nature, are subject to tidal changes of overflow and stagnation of surface-water, from spring and fall rains, and, where cut off by grading of streets and other improvements, the natural drains are closed, resulting in many stagnant, disease-breeding pools throughout the village, even to the very door-steps. As to climate, Anglesea, from the favorable contour of surrounding sounds, thoroughfares in the west and south and Hereford inlet and the sea on the north and east, has a winter climate semi-tropical, so tempered by its waters that heavy snows soon melt away, and the raw, cold winds, so common to the Atlantic coast, are almost unknown.

The water-supply depends upon both cisterns or cedar tanks and wells of surface-water, which wells, when dug in the higher places, from the leaching process of the sand, furnish pure, sweet water, but during the past unusually dry summer, many families were compelled to dig new wells in lower ground, to reach the gradually-receding water-level.

We have none but natural drainage in our streets, and from the constant depletion of our borough treasury, we have no sewers. Consequently, house-drainage is all surface. Our Health Board labor under the greatest embarrassment, for, while one family may be extremely clean and careful, their neighbor may be just the opposite. So that when complaints reach us, the cry of the owner is, give us sewers and we will connect our houses. Our Council have seen fit to divert our funds for the purpose of a useless sea-wall on the inlet front, and in so doing have shut the tide-water in as it rises in storms and floods the inside basins, becoming last summer almost unbearable from the stench.

Our streets are regularly laid out, but wofully deficient in care and cleanliness; but few have gravel on them; the gutters were entirely neglected during the past summer.

We have 70 dwellings, all occupied during the summer, 55 of them during the winter season of '92 and '93, each family occupying a separate house, with but two or three exceptions. No garbage or excreta was removed this year except by a few of the hotels at their own expense. Heretofore, it was done by contract, which plan our Board favors, if provided with the means by Council.

There has been no prevailing disease among animals. Our public school is in excellent hands; house newly painted this season, neatly fenced in, with good sanitary provisions. Our borough hall is also in good shape. Our code fully defines our health regulations in both pamphlet and circular form, and is circulated.

GEO. W. DOUGHERTY,
Secretary.

CAPE MAY CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alonzo L. Leach, M.D, Walter S. Ware, Charles P. Foster, Lewis T. Stevens, William G. Essen. George Young, Health Inspector. Post-office address of all, Cape May City.

This city is located about three miles north of the most southern point of New Jersey, Cape May, and has an ocean frontage of about four miles, and is partially cut off from the mainland by Cape Island creek, which formerly severed the place from the county. Its population in 1890 was 2,136, and they occupy about ten square miles of territory, not living very close together. There are large numbers of houses unoccupied in winter, because they belong to the vast number of summer residents. The climate of the place is most delightful, being warmer by two or three, and often five, degrees than in other parts of the State in winter and that much cooler in the summer season. The surface of the land is a white, clean sand, and then a stratum of gravel, until about ten feet down is found a series of mud strata, which have been there in prehistoric ages evidently. The contour and geology of the place allow excellent drainage, because of a creek in the rear of the town into which all sewage is carried by our sewers and drains, and each lowering tide carries it off to the sea. The water-supply comes from the Cape May City Water Works, owned and controlled by the local government and are situated in Lower township, on mainland, near the celebrated Cold Springs, about a mile and a half out of the city center. There are two large standing wells, two dug wells and the water is pumped by steam engines into the mains and distributed about the city. Over 3,000,000 gallons of water a day are pumped and used in the summer season, and almost every hotel and cottage uses it. The revenue to the city is nearly $11,000 a year from the plant.

The drainage is good, because it is constructed on a system by which the center portion of the town is the highest point, and the lines toward the city's outlets are made to gradually descend and allow a perfect flow towards emptying points. The natural flow is sufficient, and no pumping is needed to clear the pipes.

The public grounds are kept clean, and the Board of Health prohibits the throwing of trash in the streets. Nearly all the houses are occupied by their owners in winter, when owners are residents, and are occupied generally by visitors in summer. The town is lighted by electricity furnished by Franklin Electric Light Company, a home corporation. Garbage is carted out of the town between sun and sun, and the Board are adopting ordinances prohibiting the removal at any other time. Hogs are not allowed in the city limits from May to November; and no stable is allowed within fifty feet of any dwelling under penalty, under ordinance by City Council. The markets are all clean and carefully watched, and there is the greatest care on the part of owners to keep them clean, which is easy because of having plenty of room in which to conduct business.

We are aided in the prevention of disease in animals by the local Society for the Prevention of Cruelty to Animals. No slaughter-houses are allowed at any time in the city limits; and we have no manufactories in the city proper.

Our school-houses and public buildings have thorough ventilation, with improved arrangements for same, and also improved arrangements for heating in winter.

There are no cemeteries within three miles of the city.

At present we have public health laws, but before the 9th of November, 1892, goes by—the regular meeting of the Board—there will be a new code of ordinances passed, which will be an improvement on our old ordinances.

We require vaccination of school children, but this rule is not altogether complied with as much as we desire. We have had no prevalent diseases the last year.

During the year all streets have been cleaned; vacant lots cleaned either by Board or by command of Board. The outskirts of town adjoining meadow have been drained of stagnant water, and ditches dug for the furtherance of this drainage. All trash deposited along meadows has been burned within two months, by order of Board. The town has not been in better order for some years. We are prepared to take measures in the spring to prevent a spread of cholera, should it appear.

LEWIS T. STEVENS,
Secretary.

CAPE MAY POINT BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John N. Reeves, Percy Haldeman.

These are names of Councilmen. There is no regularly-organized Board of Health.

DENNIS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Goff, President, East Creek; Morris Warwick, Secretary, Dennisville; E. W. James, Dennisville; George M. Post, South Seaville. Eugene Way, M.D., Health Inspector.

The population of our township has been largely increased during the past year by the founding of a colony of Russian Jews at Woodbine. They are a hardy class, but little sickness occurring among them. The sanitary condition of the homes of most of the colonists is not all that could be desired, and with the frequent arrival of "fresh" immigrants there is danger at any time of an outbreak of any or all the contagious diseases extant. Since September 1st our Board has had special supervision over this colony, and a list of all new arrivals is kept by our Health Inspector. The Superintendent of the colony, Mr. Sabsovich, has co-operated with our Board in all things and made an inspection of all houses, and on his notification several visits were made by our Inspector and various nuisances abated.

Several complaints, from different parts of the township, have been made to our Board in regard to various nuisances, which have been promptly abated, and we can report the general sanitary condition of our township as very good. We were prepared to act promptly in case of an outbreak of cholera.

EUGENE WAY, M.D.,
Inspector.

HOLLY BEACH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Lunis, James Brannan, Elias Fercum, Martin Harrison. Post-office address of all, Holly Beach.

There is no regularly-organized Health Board. The names given are those of the Council.

LOWER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Dickinson, Chairman, Cold Spring; W. R. Lake, Physician, Green Creek Wm. S. Cummings, Fishing Creek; A. B. Walters, Cold Spring; Wm. S. Ewing, Secretary, Cold Spring.

Everything is about as it was last year, except as hereinafter stated.

There have been several cases of hog cholera, or something similar, in June and the early part of July.

There are a number of children attending public school that have not been vaccinated.

From the middle of December, 1891, to the last of February, 1892, la grippe prevailed nearly through the whole township. In July and August, 1892, cholera morbus prevailed.

The Board has been called out once to see a hog-pen that was called a nuisance.

W. A. LAKE, M.D.

MIDDLE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Andrew J. Tomlin, Goshen; Townsend W. Garretson, Cape May Court House; E. Clinton Hewitt, Cape May Court House; Julius Way, M.D., Cape May Court House. Stillwell H. Townsend, Burleigh, Health Inspector.

The questions have been answered from year to year and I know of nothing new to add.

At the last meeting of the Board, held May 14th, a Health Inspector was appointed, with instructions to make a close examination of all places thought to be in any way detrimental to the health of the residents of the township. Several persons were notified to abate nuisances, which was obeyed. The health of the people of this township has been excellent. No contagious diseases have been reported since the grip of last winter.

STILLWELL H. TOWNSEND,
Health Inspector.

OCEAN CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Peter Murdoch, Sr, Jacob Steelman, Samuel Schursh; William Lake, Secretary; J. S. Waggoner, M.D, President. Post-office address of all, Ocean City.

The season just closed has been a very prosperous one for Ocean City, in the good health we enjoyed. Some derangement of bowels was about the only trouble than required the attention of the physician, except one case of typhoid fever, which proved fatal in its early stage. In view of the anticipated cholera visitation, we believe we have put our town in a good sanitary condition, and if any cases should occur we believe we can find suitable places for them. Until lately our supply of water has been furnished by cisterns. The very dry season would have exhausted our supply had it not been for an artesian well that was bored this season, 750 feet deep, giving a flow of very excellent water. Mains will soon be laid and water supplied to the majority of consumers desiring it.

J. S. WAGGONER, M.D.,
President of Board.

UPPER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Belford E. Smith, Tuckahoe; Reuben S. Robinson, Tuckahoe; James Smith, Petersburg; Sylvanus Corson, Seaville. Randolph Marshall, M.D., Tuckahoe, Health Inspector.

The health of this township has been exceptionally good during the past year.

In October last there occurred a few cases of malignant diphtheria in an adjacent village, to which the attention of the Board was officially called. The cause was thought to be found in an undrained swamp which had been inundated by storm tide the year previous.

The saltish water had killed the vegetation. The decaying matter covered the water with a greenish scum that emitted an odor vile enough to generate any disease in the category of miasmata.

Our Health Board re-organized in August last, electing Sylvanus Corson, President; James Smith, Secretary, and R. Marshall, Inspector.

Memorandum as to cholera.—State Circular 45, as to cholera, has been published in our local paper.

Our provisions in managing a case of cholera, should any arise, would be as good as could be expected in a country town.

RANDOLPH MARSHALL, M.D.,
Inspector.

SEA ISLE CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

U. H. Huntley, Martin Wills, James Hacken, J. M. Chester; F. E. Ludlam, Mayor. Post-office address of all, Sea Isle City.

The above compose the Council. There is no report made as a Board of Health.

WEST CAPE MAY BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Reuben S. Hoffman, Barclay Schellenger, R C. Huges, E. G. Doughly. Post office address of all, Cape May City.

CUMBERLAND COUNTY.

BRIDGETON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

P. Kennedy Reeves, President; Theo B. Woodruff, Secretary; Alfred S. Sharp, Treasurer; Joseph H. Powell, Isaiah F. Barnes, David R. Streets, M.D., Edward L. Harrington, Theo. G. Davis, M.D. James S. Ware, Esq., Counsel. Jesse C. Davis, Health Inspector. Charles F. Reeves, Plumbing Inspector.

The city of Bridgeton is located at the head of navigation of the Cohansey river, a tide-water stream flowing into the Delaware bay. Population, 12,000. Climate somewhat milder than in northern portions of the State, the latitude being the same as Baltimore, Md. The geology partakes of the characteristic sameness of the southern portion of the State, the soil being composed mainly of a sandy loam, with deposits of clay or gravel in certain localities. The only stone that can be obtained is a sandstone, the ingredients of which are cemented together by the iron that is found in all the springs.

The water-supply is good, being pumped into a reservoir from a large well fed by springs. In the past, the supply was almost entirely from East lake, a body of water adjoining the water works, but, owing to the building up of that section of the town, and the consequent contamination of the lake, the Board of Health found it necessary to condemn the lake as a source of water-supply.

The natural grades of the city make the problem of drainage an easy one. Much attention has been paid to grading the streets in recent years. Gutters, for the most part, are curbed and paved; the sidewalks are generally paved with flagstone of a uniform width of five feet in those sections of the town occupied by dwellings, and bricked to full width of the walk in the business portion. A complete system of sewerage has just been adopted, and work on same is expected to begin at once. In preparing the plans and specifications of this work, provision has been made for possible future necessities. Professor McMillan, of Princeton, has had charge of the engineering, and has also prepared the drawings and specifications. The town is somewhat irregularly laid out, the streets being, in the main, fifty feet wide, although some are sixty and over.

The city is lighted by electricity, arc lamps being used at the intersection of streets, and incandescent lamps in the stores and some of the private houses. An excellent quality of gas is furnished by a local company at a low rate. Naphtha lamps are used to light the streets in the suburbs.

The collection of garbage has been in the past a difficult problem. For a time a certain number of collectors were licensed by the Board, the refuse being placed on farms or fed to hogs. As the demand for this garbage decreased and the supply increased it was found necessary to require each property-owner to be responsible for the removal or burial of his own refuse. This system has been working satisfactorily for some time. Cesspools and privies are periodically cleaned by licensed scavengers, who are authorized to charge property-holders for their services at rates fixed by the Board.

Nearly all the slaughter-houses have been removed beyond the city limits, and those that remain are subjected to rigid inspection.

The principal industry is the manufacture of glass, but there are some large machine-shops and iron-working establishments. Another prominent industry is the canning of vegetables and fruits. These canning factories make a large amount of refuse matter, and the Board has found it necessary to take action in regard to the prompt removal of such accumulations.

An increased interest is now being taken in the proper accommodation of school children. All new school-houses are built according to best modern ideas as to heating, lighting and ventilation. A handsome school-house, equipped with the best hygienic and sanitary devices, is now in course of erection.

The general health of the city during the present year has been exceptionally good, there having been no epidemics. The Board has given more than usual attention to the sanitary condition of the city; the gutters in the business section being periodically flushed, and wash-water and kitchen drainage being kept out of the gutters in all portions of the city.

There has been no provision made for reception or care of cholera patients, but the Board has the matter under consideration. A careful watch was had over incomers, particularly those from foreign shores. In case of cholera visitation next year, the Board expects to be prepared for the emergency.

P. Kennedy Reeves,
President.

COMMERCIAL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Seth Bowen, Mauricetown; Henry C. Mayhew, Mauricetown; Norton P. Lore, Jr., Mauricetown; E. J. Cook, Port Norris; D. McElwee, Haleyville. Dr. Samuel Butcher, Mauricetown, Health Inspector.

There have been no known or prevalent diseases this year. The general health has been good. Slaughter-houses have been kept in good shape. There have been no complaints or trouble of any kind. The villages are small and thinly settled. The water is all supplied from wells sunk in the ground. The natural drainage is good and all things pertaining to the general health are in good shape.

D. McElwee,
Secretary.

DEERFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTORS.

John S. Woodruff, Woodruff's Station; James Hand, Seeley; Charles C. Phillips, M.D., Deerfield. Elijah B. Parven, Deerfield, and Pierce A. Krespack, Rosenhayn, Health Inspectors.

In making my annual report as to the sanitary condition of the township of Deerfield, I have but little to add to my former reports. The health of the whole township has been excellent; no endemics whatever, and, with the exception of la grippe in the early spring, there have been no epidemics, and with la grippe there were fewer cases than in the contiguous townships. There has been but very little sickness—no diphtheria or typhoid fever—and, although the summer has been very hot, it has also been dry, thus warding off dysentery and malarial diseases. The sanitary condition of three-fourths of the township is good, but I am sorry that I cannot speak as well of the other fourth. Some few years ago Russian Jews were located in that part of the township, forming two colonies, called Rosenhayn and Carmel, and I do not think there are any worse pest spots anywhere in the State. A dirtier set of people never existed, and they do not know how to keep clean. Speaking a foreign language, it is almost impossible to make them understand what is required of them. The country is also very level, consequently the drippings from the pumps and waste-water from other sources remain on the surface, constantly stirred up by flocks of ducks. The privies are never cleaned, and the stench from them is unbearable; even those belonging to the synagogue were no exception. Men and women herd in the same room, fowls having free access up and down stairs, all serving to augment the filth, and sure, if not remedied, to breed disease. Besides, there are a number of factories for the manufacture of clothing, and the refuse cuttings are scattered over the ground, making another hot-bed for disease. Our Board of Health has taken the matter into hand, and I am happy to say that at our last meeting there, on October 6th last, we found a marked improvement, and we intend to follow it up until we teach them what cleanliness is.

Regarding the questions asked about cholera, the answer to all of them would be "No;" but if the emergency was to arise they could all be procured in a very few hours.

CHARLES C. PHILLIPS, M.D.,
Secretary.

DOWNE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

P. C. Henderson, Newport; Nathaniel Lere, Dividing Creek; R. H. Leaming, Newport; Dr. A. P. Glanden, Newport; Chas. M. Joslin, Newport.

Location, Delaware bay; Climate, mild; population, 2,000; water, from wells. Light, sandy roads. Refuse and excreta used as fertilizer. Slaughter-houses well kept. The township has been unusually healthy.

C. M. JOSLIN,
Clerk.

FAIRFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. Coates Swing, E. O. Davis, H. Bamford, Wm. Sheppard, John Thompson. W. D. Straughn, M D., Health Inspector. Post-office address of all, Fairton.

Our Board held two meetings during the past year. Matters of interest pertaining to the sanitary condition of our township were freely discussed.

No nuisances reported, no complaints made.

Owing to contour of our county here, drainage is principally surface, and in some cases better protection might be made against surface-water coming in contact with our wells.

All refuse and excreta are properly attended to and disposed of.

Our slaughter-house continues well kept, sanitary arrangements are good.

During the past summer our town has experienced quite a building boom. A large number of private dwellings have been erected; also a large glass factory, which is now in successful operation.

Many improvements have been made in our school-building. It is now heated by steam, newly painted, and slate blackboards in the several rooms. The attendance is excellent, and with a good corps of teachers, the school is doing good work.

Our cemeteries are well kept, and the laws in regard to burial are properly carried out.

The subject of vaccination is one that needs the immediate attention of our Board, and we hope soon to see the laws pertaining thereto rigidly enforced.

"La Grippe" visited us again during the winter and spring, proving more fatal than the previous year, mortality running high.

In regard to care of cholera patients, should we have any, our provisions are very meager. During the past summer our people were thoroughly aroused as regards the danger of this terrible scourge, and special attention was paid to drainage, sewerage and general disinfection.

W. D. STRAUGHN, M.D.,
Inspector.

GREENWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel R. Mills, Chairman; William P. Test, John Tyler, Jr.; John N. Glaspell, Secretary. Dr. S. M. Snyder, Health Inspector. Post-office address of all, Greenwich.

HOPEWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Cornelius Sharp, Alfred Stathems, J. F. Glaspey. Post-office address of all, Bridgeton.

LANDIS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. L. Beck, M.D., President; O. F. Rexroth, F. Bingham, Samuel Woolford, Sr. William W. Whiting, Health Inspector. Post-office address of all, Vineland.

The Board of Health in this township meets with the Township Committee the first Monday in each month and at intervals when necessary. The sanitary conditions of the township are good, the slaughter-houses and cattle-pens are carefully watched and all refuse promptly removed. During May and June I visited every house in this township and made a personal inspection, calling the people's attention to the threatened invasion of cholera and other epidemics. I also left with each family the circular upon proper precaution to be taken.

WILLIAM W. WHITING.

LAWRENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter Johnson, Lorenzo D Paynter, Harbert O. Newcomb; C. C. Foster, Assessor; Henry S. Long, Clerk. Ephraim Bateman, M.D , Health Inspector. Post-office address of all, Cedarville.

Our drainage is a natural one; our outlet, a small creek that has its origin near the center of the town, in which the tide ebbs and flows. Our cellars are mostly dry the entire year. There is a swamp near the town, adjoining which is a stretch of low, marshy land, over which the tide daily flows. We are, as a rule, particularly exempt from malarial diseases.

Houses all have cellars; the vegetables for family use generally kept therein. Cesspools built with open bottoms; contents removed by night-soil carts or buried; when removed from the town, the excreta is converted into a fertilizing agent.

A disease known here as the "blind staggers" has been quite fatal among horses. While it has not taken on an epidemic form, there have been quite a number of deaths. It commenced early in September, and is still active.

Our Board has not passed any ordinances.

We have been particularly exempt the past year from epidemics.

It has been, as far as sickness, an unusually healthy year. The summer diseases of childhood were comparatively rare, and the mortality from these affections was less than I have known it for the last forty years.

EPHRAIM BATEMAN, M.D.

MAURICE RIVER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles G. Carlisle, Delmont; Thomas S. Shaw, Dorchester; J. W. B. Vanaman, Port Elizabeth; Henry Reeves, Jr., Leesburg. S. M. Wilson, M D., Health Inspector, Leesburg.

The general health of the township, since the abatement of the "grippe" epidemic during the winter, has been good. There has been but a small amount of the ordinary summer diseases, rather an unusual tendency to dysentery with the approach of fall. Sporadic cases of scarlatina have existed, and a number of cases of diphtheria have occurred. There has been an entire exemption, supposed to be due to the dryness of the season, from the diseases among horses, such as we have at times in the form of lung fever or staggers. There have been no losses among the farmers, of hogs, due to epidemic diseases.

The entire water-supply of this section is from wells, the majority of which range from ten to fifteen feet in depth.

The Local Health Board is not often appealed to in this section, and the duties thereof are not, at the present time, onerous.

S. M. WILSON, M.D.

MILLVILLE CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edwin Conover, President; Silas C. Smith, J. W. Simmons, R. B. Radcliffe; L. H. Hogate, Secretary; J. H. Murphy, Health Inspector. Post-office address of all, Millville.

This year has been the most active in the history of the Local Board. Desiring to act in an entirely legitimate manner, the City

Council passed ordinances creating the Board, which in turn passed or adopted ordinances for its own use. The results of the efforts and labors of the Board are seen in the general good health of our citizens and the sanitary condition of the city. We have suffered from no epidemics, but have been in condition to successfully meet and cope with cholera, had it reached our community, by having arranged for a hospital, medical attendance, &c. There is a more general tendency among builders of homes to make better arrangements for disposition of night-soil and offal, which, of course, makes it better for the soil and, therefore, for the water-supply, which is the same as in former years, both from wells and water works. The Board has given attention to ventilation of cellars and the abatement of nuisances in several buildings, and has insisted on a more thorough care being taken in tenement-houses than in former years, and we feel that our city has never been so free from filth nor suffered so little from diseases as during the past year. The question of sewers is being agitated and the Board is arranging for a general vaccination in the near future. We are well pleased with the work of the year.

L. H. HOGATE,
Secretary.

STOW CREEK.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles B. Bowen, Shiloh; James R. Rainear, Shiloh; Edward H. Sheppard, Roadstown; Joseph Tomlinson, M.D., Roadstown; Ephraim Mulford, Assessor, Roadstown.

In answer to your "memorandum as to cholera," we have no provision different from other cases of sickness. We have no place where the poor can get prescriptions for cholera free of charge, except such relief as could be furnished by the Overseer of the Poor.

Nothing has occurred in the township to call the Board to act, therefore nothing has been done.

EPHRAIM MULFORD,
Assessor.

ESSEX COUNTY.

BELLEVILLE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alfred F. Skinner, Chairman; George W. Cummings, Patrick McCoy, Wm. H. Webster, John N. Klein. William Connelly, Assessor. Daniel M. Skinner, M.D., Physician. Edmund Sandford, Health Inspector. Post-office address of all, Belleville.

There is nothing new to add to former reports. No epidemics during the year. An efficient sanitary inspection of the town has been made, and general health has been good. At the time of the appearance of cholera in the harbor of New York, this Board made an appropriation sufficient to prepare a building suitably equipped to receive, isolate and care for any cases of cholera or other infectious disease which might occur, but no occasion for its use has presented itself.

D. M. Skinner.

BLOOMFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James C. Beach, President, Bloomfield; Thomas Oakes, Bloomfield; G. Lee Stout, A. J. Lockwood, Seymour P. Gilbert, Edwin A. Rayner, Martin Hummel, William H. Van Gieson, M.D.; Samuel A. Baxter, Secretary. William B. Corby, Health Inspector.

During the past year the health of this township has been very good. No epidemics of any disease have visited us, and there have been but few cases of the different contagious diseases. During the fall there have been quite a number of cases of malaria, no doubt due to the work that is being done in laying a sewer through the town, the larger number of cases being in the vicinity of the excavations. During the recent cholera epidemic extra precautions were taken regarding the sanitary condition of the town, and the appointment of an efficient Health Inspector has greatly added to the amount and thoroughness of sanitary work done.

CALDWELL BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward E. Peck, M.D., President; Morris B. Lindsley, Secretary; Lewis G. Lockward, John M. Mead, John Espy; William H. H. Condit, Health Inspector; William H. Bush, Assessor. Post-office address of all, Caldwell.

This Board is just organized.

CLINTON TOWNSHIP—IRVINGTON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. M O. Christian, President; John W. Wolf, Secretary; Ira Meeker, Treasurer, Mahlon S. Drake, (one vacancy). Dr. Joseph L. Wade, Inspector. Post-office address of all, Irvington.

The population of the village of Irvington is increasing, and more sanitary work is required. The health of the village, the past year, has been good. No epidemics, a few cases of scarlet fever and typhoid-malarial fevers, but no extension of the diseases.

The Board of Village Trustees made provision for a scavenger early in the spring. Three times a week the garbage and refuse have been removed. This was a move in the right direction as a sanitary measure. No debris is allowed to remain in the rear of premises. The sewage question must be settled in a few years, the drainage from new buildings must be provided for; many lots are too small for cesspool, cistern and privy-vault. The cesspool should be abolished, and the only remedy is a system of sewerage.

The dumping of night-soil within the incorporated village has been stopped; no nuisance from that source.

Printed notices have been sent to contractors and builders, as to location of cesspools and privy-vaults, by ordinance giving distances, &c. During this dry season many wells have been cleaned and put in good condition.

The village is in first-class condition.

JOSEPH L. WADE, M.D.,
Health Inspector.

EAST ORANGE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. E. Jepson, Chairman; W. T. Bowman, D. S. Rice, Dr. R. M. Sanger, J. W. Ellor, W. C. Schmidt, Fr. Lang, F. Coyne, Jr., C. E. Joralemon, I. L. Dodd, P. C. Williams, E. E. Bruen, W. F. Poucher; Dr. T. R. Chambers, Secretary. Henry Blaurock, Health Inspector. Post-office address of all, East Orange.

The water-supply is excellent, but at this date, November 1st, the quantity, or diminished quantity, is becoming an anxious question, the drought has become so severe.

A system of drainage has been put in the Third ward, which will render more healthy a flat, thickly-settled portion of the town. The sewer system of the town continues to give the greatest satisfaction.

A new eight-room school-house is building on Grove street. It is appointed with warming and ventilation. A new combination public building is in process of erection for court-house and police accommodations.

The expenses of the Board have been $643.50. The Board has done some very valuable work during the year. One instance is when there were nineteen (19) privies in a small tenement triangle bounded by three streets. The effluvia from this one spot spoiled the finest part of the town. To-day, owing to the efforts of the Board, there is not a vault nor closet in any one of the yards, and the whole character of the premises is neat and clean.

T. R. CHAMBERS,
Secretary.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. Rodger Kingsland, P. F. Guthrie, Jabez Freeman, Abel Kingsland, Amzi Coeyman, Dr. G. B. Philhower. Post-office address of all, Nutley.

We have abated all nuisances. The health of the township is of the best; no prevalent diseases. Water-supply by a private company.

LIVINGSTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Bern W. Dickinson, Chatham; David Flynn, Livingston; Peter S. Meeker, Roseland; George L. Smith, Livingston; William Deicks, Livingston. Dr. E. E. Peck, Caldwell, Health Inspector.

There have been no prevalent diseases in the township the past year of any kind. The lowlands along the Passaic river did not overflow during the warm weather, so there has been no malaria this year. The health of the township has been generally good. There has been but one complaint to the Board, which was promptly remedied.

GEORGE E. DE CAMP.

MILLBURN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George H. Richmond, Short Hills; J. D. Parkhurst, Millburn; Raleigh Whittingham, Millburn; John Quigley, Millburn; Isaiah Williams, Millburn. John D. Polhemus, M.D., Health Inspector, Millburn.

Millburn township is situated in the western part of Essex county. Climate may be considered healthful. Water-supply from wells, and of a good quality. Drainage good, on account of subsoil being gravelly. No sewerage. Streets and public grounds are kept clear of any matter endangering public health. Refuse and excreta placed in cesspools and removed as required. School building in need of remodeling; not enough air space on account of low ceilings. Almshouse not as well kept as law would require, and is in need of improvements, which are to be carried out under supervision of Inspector of the Board. Public health generally good. All contagious diseases are placed in hands of Inspector and utmost care given to prevent spreading. No prevalent diseases during the year. Had two cases of diphtheria, which Inspector prevented from becoming general. During the year Inspector has caused thirteen privy-vaults and five cesspools to be cleaned, also ordered three new cesspools built, two houses to be supplied with traps in pipes leading to cesspool; has had two wells thoroughly cleaned and also buried carcasses of dogs found on public highways. Two homes have been disinfected to stamp out diphtheria.

J. D. PARKHURST,
Secretary.

MONTCLAIR.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hon. John H. Wilson, Wm. H. Underhill, I. Seymour Crane, Morgan W. Ayres, M D, James B. Pier, James S. Brown; Chas. B. Morris, Assessor and Secretary. Richard P. Francis, M.D, Health Inspector. Post-office address of all, Montclair.

The water-supply has been increased by connections with the East Jersey Water Company's main, as last year's report stated.

Work on the new system of sewers will be begun in the spring.

The Mountainside Hospital, a private institution, has been opened for a year. Present capacity, fourteen beds.

On October 3d, 1892, the Board of Health passed an ordinance "for the protection of public health and the prevention of nuisances," that makes stringent regulations concerning the disposal of garbage, &c., the pollution of streams, the adulteration of food, and other points connected with the health of the town.

The general health has been excellent. With the exception of la grippe last winter, there has been no prevalent disease.

Soon after the appearance of cholera in New York harbor, a house-to-house inspection was ordered in this town by the Board of Health. Three Special Inspectors were appointed, who made daily reports to the Health Inspector. In about ten days the worst parts of the town were thoroughly inspected and notices sent to all offenders. The result has been very gratifying in that many nuisances of long standing have been abated and the town, as a whole, has never been in better sanitary condition. It is probable that a yearly house-to-house inspection will be made.

Extracts from the State Board's cholera circular were published in two local papers, and circulars giving general sanitary directions and special directions for guarding against cholera were distributed by the Inspectors.

NEWARK CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles M. Zeh, M.D., President; Alderman A. H. Johnson, Treasurer; H. C. H. Herold, M.D., D. L. Wallace, M.D., F. B. Mandeville, M.D, Mr. Edward Dunn, Mr. William B Guild, Mr. Moses Straus, Mr. Tyler Parmly. Charles Lehlbach, M.D., Secretary and Medical Officer of Health; D. D. Chandler, Chief Inspector; Herbert B. Baldwin, Chemist; Chauncey G. Parker, Attorney; William Smith, City Apothecary.

The force consists, at the present time, of sixteen regular Sanitary Inspectors, six special Sanitary Inspectors, two Plumbing Inspectors and two Meat Inspectors, one of whom is a veterinary surgeon.

The population of this city is estimated by the local authorities to be over 200,000. The city has grown so rapidly that it is impossible to give correct figures. That the population exceeds 200,000 is an absolute fact.

Number of miles of unpaved streets	135
Number of miles of paved streets	58.31
The latter are classified as follows:	
Granite block paving	12.80
Trap block paving	8.08
Telford block paving	10.87
Asphalt paving	3.03
Asphalt block	.27
Cobble stone	23.26
Total	58.31
Paved this year—	
Granite block paving	2.55
Trap block paving	3.44
Asphalt paving	1.46
Total	7.45

SEWERAGE.

Length of sewers built in city to date—	
Brick sewers	51.80
Pipe sewers	51.32
Total	103.12
Length of sewers built this year—	
Brick sewers	.30
Pipe sewers	2.90
Total	3.20

Probably more sewers will be laid within the calendar year. Certain unavoidable delays were caused by differences in opinion as to the relative merits of brick and tile-pipe sewers. The Board of Street and Water Commissioners appointed two experts to investigate this matter. As soon as their report, which is in favor of tile-pipe, has been acted upon, the work of sewering will progress rapidly.

CONTAGIOUS DISEASES.

	Reported.	Deaths.
Scarlet fever	1,688	238
Diphtheria	486	202
Typhoid fever	388	135
Small-pox	79	11
Membraneous croup	55	19
Total	2,696	605

These figures, compared with those of previous years, show that these preventable diseases have gained a permanent foothold in our city to a degree which is not creditable. The reason for this is that the facilities necessary for combating them were not at the command of this department. The first step toward commencing the fight in earnest was taken in September, when the Common Council appropriated twenty thousand dollars toward building a disinfecting station. The plans for the latter are now near completion. The building will consist of two stories. The first will contain two steam sterilizers, one 6 x 12 feet and the other 4 x 8 feet. The mode of introducing steam and hot air, and, in fact, the entire construction of these sterilizers, is the result of local talent, those in charge not being satisfied with any of the sterilizers in use in other cities. A crematory to burn infected bedding, &c., will also be contained in the first story of the building. The second floor will consist of work-room and office and headquarters for a disinfecting corps, who will visit houses and disinfect the rooms, *i. e.* attend to all disinfection which cannot be done at the station. The above is only a very brief summary of the disinfecting station. A detailed account will be given at some later date. With such a station, equipped in every respect to meet the modern demands for thorough disinfection, and with a hospital for preventable diseases, which, it is hoped, will also be at the command of this department in the near future, we will be equipped to eradicate those diseases whose numbers prove past negligence.

In reference to the small-pox outbreak, the following facts may be stated: The first cases occurred in a large tenement-house. The physician who discovered the *first* case found a woman who had all the signs of recent small-pox, and, on being questioned, she admitted that she had been sick with this disease and had been concealed from the authorities where she lived, Trenton, N. J. Two weeks after she had come to Newark the disease broke out in the family with which she was staying. From this source it spread to several houses in the neighborhood. The greater majority of subsequent cases are traced to these first cases.

Of the total number of cases, eighteen were directly due to cases concealed by physicians. The concealment of cases and the subsequent spread of the disease are conditions beyond the control of the health authorities. It is to be regretted that among the medical profession there are men who, for the sake of mere pecuniary gain, forget their true position in society and their duties and relations to the public and to themselves.

Since June there have been no cases or even suspects reported to this office. This is mentioned in view of the fact that neighboring cities are still having cases. The course pursued by this department was, first, to remove all possible danger as far as the patient was concerned, either removing him to the hospital, as was done in the majority of cases, or by *effective, absolute* isolation at home and quarantine; and secondly, to destroy by means of fire all infected articles. To these measures, with vaccination and the co-operation of the majority of the medical profession, is due the eradication of the disease.

The city is now using exclusively the water from the new supply—the Pequannock reservoirs. The water is free from animal contamination. At first there was a decided contamination, due to the decomposition of vegetable material at the bottom of these large reservoirs. This condition is now rapidly disappearing.

Notwithstanding that the Passaic is no longer relied upon as a source of water-supply by this city, it must be remembered that other cities are still forced to use it; and, moreover, it is polluted to such a degree that it is dangerous to the health of those who live near its banks. Steps should be taken to eventually insure absolute non-contamination of the Passaic. This could be done by building a trunk sewer from the Passaic falls down, and compelling all cities and towns which now drain into the Passaic to drain into it.

The new water-supply has been in use too short a time to draw any definite conclusion as to its effect upon the general health. That, eventually, the death-rate will be lowered by the introduction of a pure water-supply is certain.

During the summer this department commenced a systematic and much-needed inspection and chemical analysis of the wells in the city. Printed forms, which required answers as to the depth of the wells, their structure, time when built, the condition of the surroundings, &c., &c., were furnished the Inspectors; diagrams of the wells and surroundings were also required.

The following is a summary of the work as far as it has progressed:

Total number of wells inspected	187
Total number of wells analyzed	126

RESULT OF ANALYSES.

Very badly contaminated	17	
Badly contaminated	31	
Contaminated	23	
		71
Very suspicious	7	
Suspicious	24	
Passable	23	
Low water	1	
		55
Total		126

The contaminated wells were ordered closed.

The result of these analyses shows clearly that the ground-water in this city is in a bad condition. One of the chief causes for this is that the rules of the Board allow open-bottom privy-vaults where there is no sewerage. Consequently, there are hundreds of such foul vaults, the liquid contents of which are continually percolating into the soil and contaminating the ground-water. This matter will be considered, and it is hoped that all vaults will be ordered constructed water-tight. It is added, on general principles, that wells have no business in communities which have a good water-supply.

The collection and disposal of garbage continue as before, the garbage, mixed with ashes, being dumped in our lowlands. The question of separating ashes from garbage has been agitated and meets with approval. Under the new scavenger contract better wagons than were heretofore used are called for. The wagons which have been adopted are of a good model, metal-lined and have a dust-proof cover.

The following is a summary of the work done during the year:

SANITARY DEPARTMENT.

Nuisances and Complaints—	
Citizens' complaints made	2,049
Citizens' complaints verified	1,592
No cause	457
Total number of notices served for nuisances	3,198
Total number of notices served for defective drainage	1,213
Abatements—	
Total for nuisances	2,373
Total for defective drainage	1,013

LEGAL DEPARTMENT.

Civil suits commenced for violation of ordinances (Sanitary Code)	73
Nuisances abated after commencement of suit	26
Judgment for the department	6
Judgment for the defendant	3
Executions issued	3
Civil suits now pending	21

PLUMBING DEPARTMENT.

Number of permits to construct plumbing systems	1,072
Plans and specifications filed	783
Plans and specifications rejected	10
Number of master plumbers registered	110

Work in this department has been very good, considering the short time since plumbing law went into effect.

MEAT INSPECTION.

Slaughter-houses—	
Cattle	12,182
Calves	10,269
Sheep	12,987
Swine	1,596
Total	37,034
Condemned cattle	42
Condemned calves	34
Total	76

Meat Inspection (Markets, Butcher Shops, &c.)—

Carcasses of beef	2,455
Carcasses of lamb and sheep	8,968
Carcasses of calves	2,580
Carcasses of swine	400
Total	14,403

Condemned—

Bob-veal, carcasses	25
Bob-veal, pounds	860
Poultry, pounds	1,865
Pork, pounds	208
Beef	50
Mutton, quarters	16
Fruit and vegetables, wagon-loads	4
Cabbage, wagon-loads	1
Sweet potatoes, barrels	23

(At times small amounts of vegetables destroyed, not noted.)

During the year this department took full charge of glanders in the city. This is a change for the better, as with its present facilities more thorough and detailed attention can be paid to the cases, especially in reference to disinfection.

In conclusion it may be of interest to state that the public have awakened to the fact that in order to have a good and efficient health department one of the most essential factors is to provide the same with the proper tools to work with. The appropriation of moneys to build a disinfecting station, and the increase of the annual appropriation (this year $34,000 against $24,000 the previous year), are signs that the public is grasping the scope and function of the Health Board.

CITY OF ORANGE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John G. Gegenheimer, President; William Schluer, Health Inspector and Secretary; Amidee A. Robinson, Plumbing Inspector; Lewis Balbach, Henry G. Miller, Stephen Collins, Augustus Eickhorn. Charles Buttner, M.D., Medical Officer of Board. Post-office address of all, Orange.

The epidemic of scarlet fever and diphtheria, spoken of in last year's report, continued during the entire last year, and it is only two months since the epidemic has entirely disappeared. The means adopted by this Board to stamp out the disease were entirely successful; there were only 227 cases of both diseases against 481 of last year, although the same conditions continued to exist in the city during the year. The construction of the sewer and drainage system is continuing uninterruptedly, and in another year and a half this city will enjoy a most complete sewerage and drainage system.

The vicinity of the water reservoir has been very much improved, and the Board is determined to keep it in such a condition as to insure to the inhabitants of Orange a water-supply second to none in purity.

The Common Council has re-organized our Board this spring so as to give us seven members, and the efficiency of the Board has been correspondingly increased.

We have a most complete Sanitary Code and rules for the proper governance of the Board.

All other subjects under the schedule for reports have been spoken of in the reports of previous years, and nothing can be added this year except that we now have a "contagious hospital" sufficient for any emergency which might arise during the next five years.

CHARLES BUTTNER, M.D.,
Medical Officer of Board.

SOUTH ORANGE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alexander Melville, South Orange; Hugh Conlon, South Orange; Charles H. Beach, South Orange; John G. Aschenbach, Manhattan Park; John V. Defenthaler, Vailsburg; Thomas C. Baker, Maplewood. Dr. Anson A. Ransom, Health Inspector, South Orange.

Same as has been reported heretofore excepting a small portion of our township that has been attached to city of Newark. The health throughout the township is good; no contagious nor epidemic disease, excepting la grippe. A few complaints of nuisances have been made but satisfactorily arranged.

THOMAS C. BAKER,
Secretary.

SOUTH ORANGE VILLAGE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. F. Church, President; W. J. Nevius, Jr., Secretary; H. A. Mandeville, H. F. Hitch, C. E. Billgrist, F. A. Wright. Wm. J. Chandler, Health Inspector. Post-office address of all, South Orange.

Joint action of the Village Board of Trustees with the Township Committee has resulted in an arrangement by which a building is to be erected on the "poor-farm" (which embraces eight or nine acres of ground), for the reception of any contagious or infectious diseases which it may be deemed wise to isolate.

Especial attention has been given to the emptying of privy-vaults and disinfection thereof.

Our plan for sewerage of the village is still delayed in execution owing to litigation. We hope, however, to have the matter decided next month (November), and be able next spring to carry out a plan of sewerage which has worked admirably in South Framingham, Mass., and which will commend itself to many of the New Jersey towns remote from tide-water.

VERONA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. E. Williams, Filmore Condit, A. G. Jacobus, Anthony Bowden, M. W. Jenkins. Post-office address of all, Verona.

WEST ORANGE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Frederick W. Shrump, Pleasant Dale; Thomas W. Cunningham, West Orange; Quinten McGall, Orange Valley; John Otterbein, West Orange; Robert N. Drew, Orange Valley; John E. Brundage, West Orange. William M. Brien, M D., Health Inspector, West Orange.

The township is located among the Orange mountains, west of the city of Orange, north of the township of South Orange, east of the boroughs of Northfield and Livingston, and south of the township of Montclair. Population 4,000; climate healthful. It is a mountainous region, in which is to be found limestone and sandstone. A contract is about completed by which on and after May 1st, 1893, water will be supplied from the Pequannock water-shed. The sewerage is wholly by cesspools and into running streams. The roads are in good condition and most of them are lighted by electricity. The inhabitants comprise all classes. Public dumping-grounds are provided remote from habitations. There are no markets. There is one slaughter-house, which is well taken care of. The principal industry is the manufacture of soft hats, and there are probably 3,000 people so employed, many living in other places. The schools are healthful and are built with proper regard for ventilation. The police and prison are all that a town of like population would require. There is no fire department and few fire-escapes, and the numerous modes of exit from the factories have been considered sufficient. There are two cemeteries, which are in good condition. The Board of Health is organized as provided in the recent laws. Contagious diseases are quarantined. The expenses of the Board are paid from special appropriations made by the Township Committee. Beginning early in September a house-to-house canvass was made in the greater portion of the township and the sanitary condition much improved. Your State Inspector twice visited the township and gave valuable advice on the questions of pollution of water and dumping of animal fæcal matter. The condition of the Board of Health is better than ever before for effective work should the dreaded cholera reach our limits next spring.

William M. Brien, M.D.,
Health Inspector.

GLOUCESTER COUNTY.

CLAYTON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles H. Atkinson, President; A. G. Silver, D. W. Moore, Jr., C. C. Burroughs. H. G. Buckingham, M.D., Secretary and Health Inspector. Post-office address of all, Clayton.

The health of Clayton borough has been good during the past hot summer. The rainfall was very light during July, August, September and October. No epidemics of dysentery or malarial disease have prevailed. During the winter of 1891–2 la grippe was prevalent, and many suffering from it have not recovered their former health and vigor.

The water-supply is mostly from shallow wells. Some have abandoned these and are using instead driven wells, thus having purer water from a deeper source. Many families live in tenement-houses of only one story and without cellars. The school-houses and grounds are kept in good sanitary condition. The drainage and sewers are being improved each year.

H. G. Buckingham, M.D.,
Secretary and Health Inspector.

CLAYTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. A. Williamson, F. M. Pierce, S C. Newkirk, Chas. H. Atkinson, D. W. Moore, Jr., A. G. Silver. H. G. Buckingham, Health Inspector. Post-office address of all, Clayton.

DEPTFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. P. Stewart, Westville; H. M. Leap, Wenonah; Jos. Noblit, Wenonah. Wm. C. Cattell, Wenonah, Assessor. H. A. Stout, M.D., Wenonah, Medical Member.

The Board passed no additionnal ordinances to those already passed. Some few complaints have been made, and the Board carefully investigated the cause of the same, and ordered all necessary cleaning-up done, which was in all cases but one cheerfully obeyed. After proper time the Board took charge of the exceptional case mentioned, and had the necessary things done at the owner's expense.

Wm. C. Cattell,
Assessor.

EAST GREENWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles E. Haines, Mickleton; William Dawson, Mickleton; E. H. Steward, Clarksboro; Henry L. Haines, Clarksboro.

The Local Board has not organized during the year. Everything seems to be in a healthy condition. There have been no complaints during the year of any nuisances. I know of no immigrants arriving here during the year.

ELK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Andrew J. Proud, Glassboro; Peter S. Scott, Ewan's Mills; Damon Hitchner, Hardingville. William H. Brown, Hardingville, Assessor.

Elk township is situated in the extreme southwestern part of Gloucester county. Population, about 400. Elk township is composed wholly of a farming district, and contains no villages.

Water is obtained by wells of different kinds—some bored and some open—and a few springs are used. Drainage is by means of open ditches and tile drains. Houses are occupied by farmers mainly, and are in good, healthy condition.

Refuse and excreta mostly buried or ploughed under. Diseased animals are kept separate from others, and buried after they die. Greater care is taken than formerly. Slaughter-houses are in good condition.

Schools and school-houses are well ventilated, well lighted and properly looked after.

Cemeteries are in healthy condition. Only one case of contagious disease came to our notice this year. It was scarlet fever, which was entrusted to the care of a physician and kept confined to the house until everything was cleaned up, and no other cases occurred. The only prevalent disease was la grippe.

The principal thing done this year was oversight of the Jewish family which had the scarlet fever. Great precautions were taken to prevent its spreading, and the house thoroughly cleansed and whitewashed. There have been no precautions taken against cholera except cleanliness. There are vacant houses which could be used if needed. As to nurses, I could not say how it would be in time of cholera.

WILLIAM H. BROWN.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob K. Richman, Malaga; Samuel Lowder, Newfield; Chas. D. Smith, Franklinville; A. A. Smith, M.D., Malaga; Joshua C. Richman, Malaga.

GLASSBORO TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. H. Beckett, Thos. Allen, M. J. Luffbary, M.D., John Z. Stanger. Edward Munyan, Health Inspector. Post-office address of all, Glassboro.

A Board of Health was organized April 27th, 1892. A Health Inspector was appointed, and a Code of Ordinances passed, and published regularly.

No system of drainage, except two lines of twelve-inch pipes for surface-water. Cellars generally dry.

Have had no contagious diseases the past year.

Slaughter-houses have been inspected and found not to be a nuisance.

M. J. LUFFBARY, M.D.,
Secretary.

GREENWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. W. Miller, Chairman, Paulsboro; Francis Tracy, Paulsboro; Eli B. Allen, Gibbstown; Jacob Ballenger, Secretary, Paulsboro.

Open wells; time of heavy rains somewhat discolored; surface-drainage; no prevalent disease this year; no slaughter-houses.

JACOB BALLENGER,
Assessor.

HARRISON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jonathan G. Foster, President, Jefferson; James White, Mullica Hill; Eli Heritage, Richwood; Joseph Kirkbride, Richwood; E. E. De Groff, M.D., Secretary, Mullica Hill.

Our water-supply is exclusively from wells, and in almost every instance the supply is plentiful. The water is soft, pure and colorless with one or two exceptions, in which the water was discolored and had an unpleasant odor. The attention of the Secretary of the Board was called to it, and upon examination found the water to be foul because of insufficient ventilation, and suggested that the well be cleansed and the pump removed as a remedy for the evil.

We have no drainage system other than that provided by nature. Our water-level in the various villages throughout the township is such as to secure dry cellars in the majority of cases. Our houses have cellars, but it is only occasionally that they are used for the storage of vegetables, as many of our farmers have houses built expressly for that purpose.

The privies or cesspools have open bottoms and the excreta is removed by horse and cart and generally buried, but in some instances it is mixed with marl and used as a fertilizer.

The only prevalent diseases that have occurred in the township this year were a mild form of scarlatina during the months of January and February and the usual epidemic of la grippe.

The slaughter-houses are kept in as clean a condition as possible.

Our public school buildings are in excellent sanitary condition as relating to heat and ventilation.

Our cemeteries, unfortunately, are situated in the town, and one of them is within a few feet of wells of dwelling-houses.

Our Board has passed no ordinance this year.

The school children, as far as we are able to learn, have been successfully vaccinated.

The Board has met three different times this year, at the same time and place as Township Committee, for the purpose of curtailing the expenses of the Board. There was, during the month of September, a carload of cattle shipped to our depot, in which there were two dead calves in a state of decomposition. The Secretary of the Board was notified of the nuisance, and at once inspected it and had the carcasses buried and the place disinfected. He also visited a house to investigate the cause of foul-smelling water, made an examination of the same and suggested that the well be cleaned out and the pump removed.

The Secretary has mailed nearly 200 health circulars, No. 44, to as many families in the different villages of our township. Although we have no Sanitary Inspector (as, in the judgment of the Board, there is no necessity for such an appointment), yet we congratulate ourselves that the sanitary condition of the township is satisfactory.

E. E. De Groffт, M.D.,
Secretary.

LOGAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Honce Helms, Repaupo; J. Clark Helms, Repaupo; Joseph R. Beckett, Bridgeport; Smith Shoemaker, Bridgeport; E. T. Oliphant, M.D., Bridgeport.

Our cellars are generally dry, except in a few instances. Houses generally have cellars, which are mostly dry and are used for storage to a small extent. No system of drainage except drain-tile in low farm lands. Water-supply entirely from wells; depth from 15 to 25 feet. Some few cisterns, used for washing purposes. No sewers. Slaughter-house, in fair condition. No animal disease this year. No manufactures. Have two public buildings, town hall and school-house, both in good sanitary condition. Three cemeteries, about half a mile from town and on high land. Burials are from four to five feet deep. Had several isolated cases of dysentery this last summer. We have quite a number of children in our township that have never been vaccinated. We have had some few cases of typhoid fever this fall.

E. T. Oliphant, M.D.,
Health Inspector.

MANTUA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter P. Watson, Assessor, Pitman Grove; Jos. D. Ludge, Pitman Grove; John Sharp, Barnsboro; Frank Denn, Mantua. Dr. E. Z. Hillegass, Mantua, Health Inspector.

Our water-supply comes from wells. No cisterns. No discoloration nor bad taste. It is hard.

We have no system of drainage. The cellars are mostly dry. No swamps to mention. Malaria unfrequent.

Our houses have cellars. Some few are used for the storage of vegetables. No tenement-houses. No yearly house-to-house inspection.

We have no sewers. Cesspools are built with open bottom and sides; the contents are carted on to farms and used as fertilizers.

No prevalent diseases during the year. The Assessor does not inquire as to losses of animals, and as to contagious diseases.

Slaughter-houses are inspected, but still remain a nuisance to the town.

Schools and buildings are kept in first-class sanitary condition.

Our cemetery is kept in good condition. The burials are performed in strict conformity to the law.

Our Board has passed ordinances.

The collection of vital statistics is reported monthly.

We have had a few cases of scarlet fever during the past year; they were isolated from the rest of the family to the best of our ability. Vaccination appears to be almost entirely neglected.

Our dwellings are chiefly heated with stoves; some few heaters. Ventilation is good.

No prevailing diseases during the year.

Our Board has done very little during the year. Have had a few meetings to suggest a way by which we would be able to have our slaughter-house moved out of town, which is *the* existing nuisance. The Board could not agree upon any measure, therefore it was laid over, which, I am sorry to say, has been the case the past four or five years.

MONROE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. Sickler, Chairman; D. S. Champion, R. F. Tice, J. W. McClure, Clerk; J. Gaunt Edwards, M.D., Medical Director. Post-office address of all, Williamstown.

Williamstown has about 1,600 inhabitants, and in the rural district 400. We are on the line of the water-shed between the Atlantic slope on the east and Delaware river basin on the west. The town is about one hundred and thirty-five feet above low-water mark of either. The county is exceedingly level. Swamps are numerous, but no streams of water or ponds within a mile and a half of the town. The soil is fairly good, and from one and a half to two feet we have a stratum of excellent gravel five to ten feet deep, then coarse red sand. Water-supply wholly from wells. The water is hard, very clear, cold and excellent quality; not a poor well known in the community; depth from ten to twenty-five feet. Drainage and sewerage very poor, owing to the level country. The streets are looked after by Local Board and Township Committee. The houses, as a rule, are good, except some on the back street occupied by the laboring class of the glass firm, which are very poor and uncomfortable.

The refuse and excreta are removed at night in cold weather, and by private parties, who utilize it as fertilizer.

There are two slaughter-houses in the town, which are looked after by the Local Board, yet they should be prohibited.

The glass manufacturing interest is the chief business of the town. The factories are in fair condition and surroundings looked after by Board of Health.

There are also two large canning-houses in the town, but the refuse is carted out of limits. Also one pickling-house, which is kept very neat.

There are two public school-houses in the town, both of which are overcrowded, and the ventilation of a part of the large building makes it a fit building for the Board of Health to condemn.

The police or town lockup is also a death-trap hole, and not fit to be used as such, owing to its dampness.

There are three cemeteries in the heart of the town, which will eventually be not only an eyesore but a nuisance.

The Local Board is on the alert, and always responds to any complaints, and adopted three years ago the code of laws of the State Board, but modified to suit as indicated.

No quarantine or vaccination looked after by Local Board.

There have been no serious epidemics during past year.

The Local Board has been annoyed by manure being shipped direct into the town and the cars unloaded, notwithstanding the Local Board has given the railroad company due notice to suspend the same nuisance. The law will be enforced, however.

J. GAUNT EDWARDS,
Medical Inspector.

SOUTH HARRISON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles K. Horner, Alfred Lippincott, Joseph S. Cheesman, Amos T. Eastlack; Samuel F. Stanger, M D., Secretary. Post office address of all, Harrisonville.

Water-supply is derived from wells and cisterns. During the latter part of summer, complaint was made to our Local Board that the slaughter-house, which is situated on the outskirts of our village, was giving off a very offensive odor, making it almost unbearable for the nearby residents to remain at their homes. The Board held a meeting September 2d, examined the premises and found them in a very foul condition; ordered them cleaned and disinfected, which was soon accomplished, and the source of nuisance was removed. The general health of the community has been good.

S. F. STANGER, M.D.,
Secretary.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. C. B. Phillips, Hurffville; Evan Davis, Hurffville; B. Frank Allen, Hurffville; Alfred R. Randle, Hurffville; Charles D. Nicholson, Turnerville.

Our township has had very little sickness. Our Board has had several meetings this summer. At our last meeting, in September, we had circulars printed and sent to every house in township stating the law. The Board is over the township every week more or less, and we find the sanitary condition first-class. We have no village with more than 175 inhabitants and do not think we need an Inspector.

C. D. NICHOLSON,
Secretary.

WEST DEPTFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John C. Budd, Joseph A. Moore, John W. Leonard, Mark Clement. Dr. H. A. Wilson, Health Inspector. Post-office address of all, Woodbury.

The water-supply is mostly from wells. The houses are mostly frame houses The Board met and organized March 18th, 1892; met again June 27th, 1892, and authorized to give notice that the Board would meet July 11th, 1892, to hear complaints and suggestions. There have been two complaints about dead horses being left without burial. The Board had them buried and may be compelled to sue for expense incurred.

MARK CLEMENT,
Secretary.

WOODBURY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Walton, President; Wm. M. Carter, Secretary; Warner Underwood, Treasurer; John C. Tatum, George K. Carroll. T. E. Parker, M.D., Health Inspector. Post-office address of all, Woodbury.

Woodbury is an incorporated city of 4,000 inhabitants, eight miles south of Philadelphia, and two miles inland from the Delaware river. It is situated on a slight elevation, permitting good surface-drainage.

Water is supplied by the city from a free-flowing stream of good water, uncontaminated by any sewage, and great care is taken to keep reservoirs and conduits clean and clear of debris. Very few wells and cisterns are now in use, the citizens having become educated to the fact that they are prejudicial to health, and that the city water is more palatable and more wholesome. All unused wells have been ordered filled up.

We have no system of sewers. The waste-water is generally carried by open or closed drains into the streets or into open-bottomed cesspools. These are a source of great annoyance to the Board of Health, as debris drops into gutters and stops the flow, and the surrounding vegetation and leaves fall into them and become decomposed. Frequent attention is given to them by the Board, and they are all cleaned and air-slaked or chloride of lime is freely used, which gives only temporary relief. The better class of houses have bath and water-closets; contents are emptied into open-bottomed cesspools, and the sandy soil permits the absorption of the soluble matter. These cesspools are trapped and generally well ventilated, and but few complaints come to our notice. The majority of the houses have out-door privies, emptied by the owners and contents carted away and used as fertilizers. Our rule is that these must all be cleaned between October 1st and April 1st, and between the hours of ten P. M. and four A. M. Most cellars are drained; in a few cheaper houses in low places water is found in wet seasons. We urge an annual whitewashing of all cellars.

We have very little malaria. Grippe had its run during the month of December, with but little fatality. Scarlet fever in a mild form infected the town in isolated spots during the winter and spring months, with only a few deaths. A report of all contagious diseases is required, and care is used to keep the schools from becoming infected. The animals have been generally healthy. No hogs are permitted in compact portion of city. There is no slaughter-house within city limits. No nuisances are generated by any factory.

The public school buildings are in a good sanitary condition.

There are several cemeteries within the city limits. Some are never used, two are used occasionally, and one, owned by the colored people, is frequently used and is now almost full. The Board has recommended the use of all be prohibited.

We have a Sanitary Code, and this, with circulars containing hints for protection against cholera and timely advice for householders, has been carried to every house and the residents urged to read them.

No general vaccination has been done, as there has been no dread of small-pox. We have had no need for quarantine. Where contagious cases were located, isolation was enforced, and those in attendance cautioned and requested not to mingle with other people.

The Board has personally visited all parts of the city, and a house-to-house inspection has been made. All nuisances were immediately attended to, and the Sanitary Code has been enforced as far as possible.

T. E. Parker, M.D.,
Inspector.

WOOLWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Howard V. Locke, President; George Meley, James Batten, Benj. F. Buzby, M.D. Samuel Avis, Secretary. Post-office address of all, Swedesboro.

Woolwich township is located 19 miles south of Camden, and has a population of 2,150. Soil, sandy, with clay and marl bottom; generally level, but has some few rather prominent hills. Raccoon creek flows through the township, and Oldman's creek forms the southwest boundary, with a narrow strip of meadow along each creek.

Water-supply, wells and cisterns. Refuse and excreta buried, generally; sometimes put in manure heaps and carted to fields. No diseases of animals. One slaughter-house. Four school-houses, all in good condition. Six burial grounds, one cemetery. Code of ordinances as recommended by State Board of Health, sections 1 to 13. Adopted two sections additional the present year (see X., sections 14 and 15); form as given by State Board.

Contagious diseases are quarantined by excluding others from houses where such diseases exist, and all due care taken in all other particulars. Vaccination not enforced. Epidemic influenza and pneumonia frequent in winter. More dysentery than usual, and bowel troubles generally more prevalent. Nothing else much during the year, and we have no epidemics of much importance.

The Board has held three meetings this year, one in the spring, when they organized and named a day to hold a meeting to hear complaints and transact general business, which was duly advertised in the local newspaper. Passed two new ordinances. There have been very few complaints of nuisances, which were attended to at once by the Board and promptly abated.

SAMUEL AVIS,
Secretary.

HUDSON COUNTY.

HUDSON COUNTY BOARD OF HEALTH REPORT.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William W. Varick, M.D., Charles B. Converse, M.D., C. Holmes McNeil, M.D. H. W. Winfield, Counsel; C. J. Rooney, Jr., Clerk. Post-office address of all, Jersey City.

We respectfully offer the accompanying mortality reports, &c., for the past year and also the following brief notes of certain sanitary work done by the Board:

There was, as usual, a large number of complaints of many kinds received and investigated, and, when possible, the proper remedies applied. In most of these cases a proper adjustment of the difficulty was brought about by the Inspectors, but in many the aid of counsel had to be invoked before the recalcitrants could be induced to apply the indicated remedy. The spreading of hog hair to dry in the sun on the Hackensack meadows was complained of and examined into by the Board. The hair, scraped from the hogs when killed at the abattoir, was by a New York firm manipulated and treated at the rear of the abattoir some distance from it. It was found to cause a great stench and the Board caused a stoppage of the business at that place. A prolific cause of complaint has been the running of house drainage upon the streets. A large number of houses have been connected with the sewers where such exist, through notice from counsel. Three houses in Fifth street, Jersey City, were considered to be unfit for habitation and notice served upon the inmates to vacate them at once.

A case of leprosy in a Chinaman caused considerable annoyance in the town of Harrison. The Board took charge of the case, procured an expert diagnosis of the disease and removed the unfortunate to Snake Hill, where he is now isolated.

Large quantities of manure had been piled on Jersey avenue, Jersey City, and some parallel streets, near the line between Jersey City and Hoboken. After a considerable time the Board succeeded in having those accumulations removed. Efforts have lately been made to again carry on the same business on Jersey avenue, Jersey City, but it was prevented by the Board.

Suits for violation of various ordinances have been brought and many penalties imposed.

The dumping of garbage for filling in sunken land has engaged the Board's attention. Large sections, generally railroad property, are in process of filling, and very often the character of the material used is such as to be offensive, both to the eye and the nose. This has been controlled in many cases, and top dressing with a sufficient depth of clean earth or ashes has been insisted upon. But constant vigilance is necessary in order to insure the carrying out of these regulations.

A large number of applications for permits to carry on certain trades liable to create nuisances and for cow permits, have been received and inspections made during the year.

Complaints have been received of certain factories that create more or less unpleasant odors, and the Board has induced the owners in these cases to apply such remedies as would do away with the cause of complaint. Where the business was not such as to be readily rendered free from unpleasant or deleterious odors, the Board has refused to give permits to carry it on.

Three cases of glanders have been reported; two were verified and the horses shot, and the bodies taken away. In the other case the diagnosis of glanders was not confirmed.

A number of cases of lump-jawed cattle were looked into by the Board's Inspectors. These cattle had been shipped to this point for sale. The Board had them killed and the bodies rendered unfit for food, so that they could not be sold.

Complaint was received of a certain slaughter-house at Homestead, North Bergen, that it occasioned much discomfort by reason of the odors emanating from it. The building was torn down under supervision of Inspectors of the Board.

On February 10th, 1892, a case of small-pox, female, age 13 years, was reported at Harrison, N. J. The case was taken to the contagious disease hospital at Snake Hill, and vaccination of the surrounding residents carried on. It was not found practicable to trace the origin of the case.

In all, there were seventeen cases reported up to date (August 26th, 1892). Most of the cases were taken to the small-pox hospital at Snake Hill by order of the Commissioner of Health, C. B. Converse, M.D., where they were cared for under his supervision.

In all cases immediate vaccination of all who were in any way exposed was practiced, together with fumigation. In all cases the disease was confined to the dwelling in which it originated and to those who came in contact with the infected family. That the promptness of the Board's action and the effectiveness of its measures secured this result is the belief of all who are aware of the facts.

There were 2,380 cases of contagious diseases reported from July 1st, 1891, to July 1st, 1892. Inspections were made and children excluded from school in these instances until it was considered safe to allow them to return.

The different cases of disease included above were as follows:

	Diphtheria.	Scarlet Fever.	Membraneous Croup.	Typhoid Fever.	Measles	Small pox.
1891.						
July	59	62	7	1	2	....
August	63	79	4	7	1	....
September	54	73	9	69	1	....
October	35	47	18	51	2	....
November	52	93	7	43	1	....
December	62	131	9	20	....	....
1892.						
January	52	119	5	10	....	....
February	76	168	17	15	....	1
March	65	184	7	11	....	1
April	41	174	4	7	....	6
May	38	166	4	8	13	1
June	29	85	5	9	3	1
	626	1,374	96	251	23	10

There was considerable typhoid fever in the fall of 1891.

C. J. ROONEY, JR.,
Clerk.

BAYONNE CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. C. Farr, Mayor, President; Jno. W. Goddard, Wm. Burrows, F. F. Martinez, Jr., Secretary; S. V. Morris, M.D., Jas. Brady, Geo. A. Schmidt. Robert G. Nolan, M.D., Health Inspector; Caspar Schmidt, Deputy. Post-office address of all, Bayonne City.

Since last report about three miles of sewers have been built and water-system extended. We are at present supplied with Passaic water, but we hope soon to have better water, as the Montclair Water Company is extending its system to Bayonne.

During the prevalence of cholera, we used one and a half tons of chloride of lime and the same quantity of green vitriol, thoroughly disinfecting the city.

We have had an unusually healthy year.

F. F. MARTINEZ, JR.,
Secretary.

TOWN OF HARRISON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. M. F. Squier, President; Dr. Henry Allers, Dr. H. E. Rothe, William J. Davis; Clarence T. Van Deven, Secretary. John Callaghan, Health Inspector. Post-office address of all, Harrison.

Population about 8,500. Water-supply from Passaic river, same as Jersey City. Drainage and sewerage fair. Gas and electricity are used for lighting purposes. No epidemics during the past year and general health unusually good. The Board has been re-organized during the past year, and besides the regular Inspector two additional ones have been employed and a general house-to-house inspection has been made, and all nuisances found have been abated; have adopted a Health Code in conformity with the State law, which also includes the reporting by physicians of all cases of contagious diseases, and the placarding of all houses where such diseases exist, and measures were taken to see that the same is enforced. We have also had an analysis made of the water from wells in the town and have ordered all wells closed found contaminated. A complete sewerage system is now under consideration and will probably be completed in the near future. Several streets have been sewered and paved during the past year.

HOBOKEN CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Palmer Campbell, President; John Tallon, Louis V. Hengstler, Louis S. Fugazzi, E. T. Steadman, M.D.; D. B. Pindar, M.D., Health Warden; Francis L. Laverty, Clerk. Antonio Granelli, Health Inspector. Post-office address of all, Hoboken.

The United States census of 1890 gives a population of 43,648 to this city.

The water-supply is drawn from the Hackensack river at New Milford.

Drainage and sewerage insufficient and imperfect. We have taken steps to have the sewerage system of the city thoroughly overhauled. During the summer months we superintended the cleaning of all the receiving basins in the city (about 500), and had the same disinfected several times.

Streets in the populated section of the city are all well paved, and are kept in a fairly clean condition. Public grounds are kept in good condition.

During the past summer we had every building in the city inspected by a corps of policemen acting as Sanitary Inspectors, which resulted in the abatement of about one thousand nuisances. We expect to be able to obtain valuable information from the reports after we have tabulated them. The houses are largely tenements and flats, with a number of small one-family houses.

The lighting of the houses is principally by gas, and the streets by electricity.

Garbage and ashes are used for filling meadow lands, under contract with the Mayor and Council. We will recommend the use of some other method in the near future, in disposing of the garbage. Licensed scavengers clean the privies and vaults and remove the excreta to scows in Jersey City.

There are about five private markets in this city, all of which are kept in good condition.

In the last month there have been six cases of glanders among horses. All of the horses were killed, and the stables in which they had been kept were disinfected by our Health Inspector. We also ordered the removal of a watering-trough, to which we had traced the disease in three of the horses.

There are no slaughter-houses or abattoirs in the city.

There are six public and five private schools in the city, all in good condition. Since our last report the city has built a school-house at a cost of $100,000, which has all modern improvements of ventilation, &c.

There is but one hospital in the city, which is kept in the best of condition. Outside of this we have a day nursery and widows' home, both well managed as to sanitary matters.

There is but one prison in this city, although the authorities have now in course of erection a new one in the upper part of the city. The old one is unsanitary.

All the new houses have fire-escapes.

There are no cemeteries within the limits of the city.

Sanitary Code and regulations have been passed in accordance with the law.

The law is rigidly enforced, and all physicians, midwives and clergymen report. A record is kept by the Clerk, who acts as Registrar of Vital Statistics.

All quarantine regulations are of the best. Small-pox cases, where it is impossible to isolate patients, are removed to the county pest-house. Through our advice, the Board of Education passed a resolution that all school children would be compelled to show a certificate of vaccination before they would be admitted to the schools. Under our supervision there were about two thousand five hundred children vaccinated during the past year. The expense was borne by this Board.

One thousand five hundred dollars was appropriated by the city for this purpose.

The following cases of contagious diseases have been reported during the past year: Small-pox, 10; diphtheria, 72; scarlet fever, 326; membraneous croup, 27; typhoid fever, 20. Two hundred and forty-nine of these cases were reported from the lower section of the city, where there is a great deal of meadow land.

F. L. LAVERTY,
Clerk.

JERSEY CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John P. Feeney, President; James E. Kelley, Benjamin Van Keuren, Dr. Hoffman. Daniel W. Benjamin, Health Inspector. Post-office address of all, Jersey City.

The water-supply is from the Passaic river, introduced in 1852, and from wells. The drainage is by sewers, emptying into the Hudson and Hackensack rivers. The city is lighted by gas and oil lamps and electricity. The night-soil is removed by scavengers, who dump it into scows provided by the city. The scows are towed away and taken to some place where there are farmers who desire it as a fertilizer. It is unloaded from the scows into air-tight wagons and taken to the farms, where it is mixed with sand before being used. The ashes and garbage are collected by carts and used to fill up sunken meadow lots, covering the same with two feet of soil. The slaughter-houses and abattoirs in the city are located on the river front and over tide-water. We have twenty-five public schools and a number of private ones. We have three hospitals, the City Hospital, supported by the city, St.

Francis and Christ's, which are under the control of religious sects and are supported largely by contributions. The police force of the city numbers two hundred and ninety-six men, who are under the control of the Board of Police Commissioners; each officer is required by rules of the Police Department to aid the Health Department in ferreting out and reporting to the Health Inspector all nuisances existing upon their post, and also aid in their abatement.

The laws governing our action are a Code of Rules and Regulations, adopted by the Board of Health, and embrace everything that is or may become a nuisance; each section of the code has a fixed penalty for non-compliance therewith.

When it becomes necessary to quarantine a house or other place, if the force connected with my office is not sufficient, I make application to the Superintendent of Police, who details the necessary number of men from the police force to thoroughly quarantine such place or house. If a case of small-pox or other dangerous contagious disease appears, we notify the County Physician and remove the person afflicted to the pest-house at Snake Hill and thoroughly fumigate the premises.

During the year we have visited nine thousand premises, and have found five thousand six hundred and eighty-five nuisances, and have abated three thousand five hundred and ninety, and are still engaged in abating the balance of those complained of. The nuisances found and abated are as follows:

NUISANCES COMPLAINED OF.

Privies	3,198
Waste-water	274
Defective plumbing	225
Garbage	292
Stables	210
Cellars	408
Sunken lots	151
Sewer gas	107
Yards	637
Gutters	101
Receiving basins	82
Total	5,685

NUISANCES ABATED.

Privies	2,267
Waste-water	172
Defective plumbing	102

Garbage	221
Stables	103
Cellars	194
Sunken lots	40
Sewer gas	66
Yards	355
Gutters	30
Receiving basins	35
Total	3,590

During the year we have disinfected 35 receiving basins, 24 gutters, 19 premises, 20 yards, and 15 streets, making a total of 113 disinfections. I have vaccinated 513 persons and have sent 6,555 notices to abate nuisances.

D. W. BENJAMIN,
Health Inspector.

KEARNY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry C. Greene, Arlington; Jesse Carver, Kearny; J. J. Jones, Kearny; Wm. Greene, Kearny; Geo. J. Stillwell, Kearny, Inspector; Wm. Tolan, Kearny. J. A. Exton, M.D., Arlington, Health Officer.

Kearny township is located in the extreme northwestern portion of Hudson county. It is bounded on the north by Bergen county, the old road from Belleville to New York being the northerly boundary line; the westerly boundary line is the Passaic river to a point near the free bridge over the said river, and which bridge connects the Town of Harrison and Newark; the southerly boundary line is very irregular, and ends, after taking a zigzag course through Harrison, below the Newark and Paterson railroad, at the old plankroad running from Newark to New York; and the easterly boundary is the Hackensack river, to a point where it meets the road from Belleville to New York. The population is about 8,000, and is increasing each year. The climate is much the same as that of all towns bordered and influenced by tide-water.

Ot the geology of the township, it can be said that that portion bordering on the meadows contains large amounts of copper ore, sandstone and shale.

One-quarter of the township is marsh meadows, from which is gathered salt hay in season.

The water-supply, previous to the introduction of the Passaic water, was obtained from wells and cisterns, and was much more satisfactory than that foul liquid more recently obtained from the Jersey City reservoir.

The drainage is a natural one, as the township is situated upon an elevation; the natural slope furnishes all that could be desired.

The sewerage system, which has been introduced within the last year, is ample, deep and satisfactory. It consists of one mile of brick sewer, six feet high and five feet wide, and has its outlet in the Passaic river at a point one-half mile below the Lister works, situated on the same. The laterals are made from earthen pipes, sunk from twelve to fourteen feet in the ground, and of the required dimensions which necessity seems to demand, and aggregate six miles. The streets are numerous, and about eight miles of them are curbed, flagged and guttered, and about four miles are macadamized.

The houses are principally frame, and vary in value from $1,000 to $10,000. There are also a number of brick houses of good style and equal value. They are tenanted by a population the male portion of which is employed in the city in the usual avocations of life and business, while others are employed in the various mills and factories which are located in the township.

The method of lighting is by gas in the buildings and electric for the streets.

The refuse and excreta in the township are disposed of by carts; the refuse made use of to fill in sunken lots, and the night-soil for farm purposes.

The markets are kept in a cleanly condition, and their offal removed by parties who make a business of rendering such material for soap-fat, &c., &c.

There are no diseased animals in the township, and systematic inspections are made by the county authorities at stated intervals. There are three slaughter-houses in the township, located in the extreme lower corner of the township, and they are regularly inspected by the Health Inspector.

There are four school-houses in the township, situated in convenient localities, and accommodate about 1,350 children and employ 29 teachers.

There are also three fire-houses well equipped with apparatus for the purposes intended. The township also possesses a town hall, where the business of the same is regularly transacted.

There are no alms-houses, hospitals or other public places where charity of that kind is usually bestowed.

The police protection is equal to the needs of the township, numbering as it does eight uniformed patrolmen on the force and controlled by a chief, who is also a police magistrate. There are no prisons and no need for the same. Three cells in the basement of the town hall offer a place for the short time necessary for incarceration.

As to cemeteries, we have but one, known by name as the Arlington, and situated on a beautiful slope of ground facing east, and located on the easterly side of the Old Copper Mine road, just south of the Bergen county line. It is patronized by Jersey City, New York and Newark.

The public health of the township is satisfactory, and since the organization of the Health Board residents have become personally interested in such matters, to the end of assisting the Board in all its laudable undertakings.

The collection of vital statistics is made through the County Board of Health by the desire of that Board, and the physicians are by ordinance required to report all such to the health officer of the township, to the end that proper inspection may be made and any nuisance responsible for the disease reported may be promptly abated.

The sanitary expenses of the township this year are very meager for the amount of work done. Since the organization of the Board in June last a house-to-house inspection has been made and the town divided into districts. Each of the districts has a record-book of its own, in which is kept an account of each unsanitary house, when inspected, &c., &c. The Inspector is required to carry with him three varieties of cards, in different colors, on which is printed the following: "Inspected by order of the Board of Health," then the date of inspection and the condition of the premises, namely, good, fair or dangerous to health. The Inspector is required to nail one of these upon some portion of the premises, chiefly the outhouses, and to keep a record of the last-mentioned only, and if the parties do not abate the nuisance within a reasonable time he makes another visitation and serves a formal notice upon the owner or agent to do so. If, when the specified time is up, the nuisance still exists, it is abated by the Board and the expense collected from the owner by process of law. During the past four months the number of nuisances reported to the Board was 184. The number of these abated up to the writing of this report was 104, showing the effect of a Local Board of Health. Of the heating and ventilation of dwellings I have to say that the most prevailing is dry heat from furnaces. Steam has its share to the extent of perhaps one-tenth, while in the more recent houses hot water is being given a trial. The prevailing diseases during the year have been scarlet fever, typhoid fever and diphtheria, a few cases of each having been reported to the Board.

J. A. Exton, M.D.,
Health Officer.

NORTH BERGEN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Pinnell, New Durham; Abm. W. Duryee, New Durham; Wm. Wilmington, New Durham; Romeo Y. Churchill, Secaucus; Edward Lussen, Fairview. George Bruce, Health Inspector, New Durham.

Location, North Bergen township, Hudson county. Population about six thousand inhabitants.

Good township roads.

Eight schools.

Examined several places and had their sanitary condition improved.

J. Chas. Engle,
Secretary.

HUNTERDON COUNTY.

ALEXANDRIA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Weller, Chairman, Mount Pleasant; E. H. Opdyke, Everittstown; David Phillips, Little York. Joseph P. Stout, Assessor.

BETHLEHEM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Mayberry, Glen Gardner; George A. Hackett, Bloomsbury; J. V. Willever, Bloomsbury; Stewart Rodenbaugh, Norton; E. L. Riegle, M.D., Bloomsbury.

Our Board has passed ordinances and is thoroughly organized.

CLINTON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph W. Berrey, Erastus Runyon, William Knight, M.D., James R. Kline
Post-office address of all, Clinton.

No diseases of animals. No slaughter-houses in borough limits. Public health good. Laws, &c., well looked after. No prevalent diseases for the year. Board has looked after all nuisances carefully.

CLINTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Case, Hamden; John C. Cramer, Annandale; Luther Hoffman, Lebanon; Bergen B. Berkaw, Annandale; Willard E. Berkaw, M.D., Annandale.

The Board of Health of Clinton township, although there are two villages, Lebanon and Annandale, within its boundaries, have not deemed it necessary, up to this date, to appoint a Sanitary Inspector.

Supply entirely from cisterns, wells and springs; no public water-supply. Only natural drainage; no sewerage system. Cellars are mostly dry, except during very rainy seasons, when surface-water temporarily gets in cellars. Houses mostly have cellars, and very often during the winter season they are largely used for the storage of vegetables. No tenement-houses of more than two families. No yearly house-to-house inspection. No sewers used. Cesspools are mostly merely holes in the ground. Very few cemented cesspools. A few are boxes which may be drawn out and contents removed. Cesspools, when filled, are usually not emptied, being filled with soil and sometimes lime, and new places opened. The contents, when removed, which is not usually done, are spread over soil after being acted upon by lime. No diseases of animals known to the Board during past year. Instructions have been given to butchers to keep their slaughter-places from annoying the public.

During the summer of 1892, application was made by the Lebanon Cemetery Company, of Lebanon, for permission to enlarge their cemetery grounds, in the village of Lebanon. A protest was entered by adjoining property-owners. After a full hearing by the Board, the request for permission to enlarge was denied. The Board have passed no ordinances during the year.

In the spring, 1892, a case of diphtheria occurred in Annandale public school district, the child being an attendant upon said public school, and death soon ensued. Our Board at once closed the public school, and directed that the family bury privately and hold memorial services at a later date. The recommendation of our Board was willingly complied with. No other cases occurred. As to vaccination, a more thorough awakening on this subject has taken place by reason of the school law concerning the same.

During the months of January, February and March, 1892, la grippe prevailed to a very free extent; also during months of July, August and September, 1892, bowel diseases were more than usually prevalent. During winter, 1891 and 1892, several cases of measles existed where Clinton township adjoins Readington township, in which the disease was epidemic.

The Board met following the annual town meeting and organized as required by law. A meeting of the Board was called in May to take action upon closing public school in Annandale school district by reason of diphtheria, and also to receive application from Lebanon Cemetery Company. Again, on June 10th, 1892, Board met to give hearing on application to enlarge cemetery, as stated above.

Report in answer to annex to Circular 45—"Memorandum as to cholera:"

A general answer to the circular states that the Board remained quiet during the cholera scare, ready to act if circumstances demanded. No provisions were made to meet any cases beyond the full and complete organization of the Board.

Our Board does not think a Sanitary Inspector is necessary just at present.

BERGEN B. BERKAW,
Secretary.

DELAWARE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Sherwood, Stockton; Isaac Lake, Sergeantsville; Joseph Servis, Sergeantsville; Jacob H. Holcombe, Secretary, Lambertville. Geo. N. Best, Rosemont, Health Inspector.

Have had two meeting since last report. First meeting November 18th, 1891, in regard to small-pox scare. Two Italians went out on train over the Belvidere Division of Pennsylvania Railroad, and met a number of our citizens on said train. Italians were thought to have small-pox, so we held a meeting and ordered Health Inspector to go through our schools and vaccinate all unprotected children, which he did, except where objections were offered by parents. We held a meeting April 20th, 1892, to hear complaints, but none were offered. We shall hold meeting to pass ordinances.

J. H. HOLCOMBE,
Secretary.

EAST AMWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theo. Y. Craft, President, Amwell; Levi Holcombe, Secretary, Ringoes; Ira Higgins, Wertsville; V. D. Losey, Ringoes. Peter C. Young, M.D., Health Inspector.

No prevalent contagious diseases during the year.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Q. E. Snyder, M.D., Quakertown; E. B. Suydam, Quakertown; J. K. Roberson, Quakertown; Geo. W. Snyder, Quakertown; John Van Kiney, Sidney.

This Board has done nothing more than organize. The health of this township has been very good the past year. No contagious diseases reported. Only one slaughter-house, and that is well managed.

G. W. SNYDER,
Assessor.

FRENCHTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. B. Nash, M.D., Geo. F. Bloom, Robert McIntyre, O. R. Kugler, Secretary. Post-office address of all, Frenchtown.

We have had no meetings this year. The borough is in about the same condition as at last report. There have been no complaints but what have been looked after promptly by the President and Secretary of the Board.

O. R. KUGLER,
Secretary.

HIGH BRIDGE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David M. Sharp, Chairman, Annandale; T. F. Budlong, High Bridge; T. O. Aller, High Bridge; L. W. Dorland, Secretary, High Bridge. W. C. Alpaugh, M.D, Inspector, High Bridge.

The health of the township has been about the same as in previous years. The principal work of the Board has been to impress upon the people the importance of keeping the township healthful. We have adopted a code and published and circulated it.

L. W. DORLAND,
Secretary.

HOLLAND TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Stern, Milford; Irvin Hoff, Milford; Robert Winters, Warren Paper Mills; Mathew Wean, Mt. Pleasant; George T. Ribbley, Milford.

No epidemic among our animals. One slaughter-house in the village of Milford, the only one, I believe, in the township, had been complained of some, and on investigation found a pig-pen in the vicinity the greater nuisance. School-houses all right; have no other public buildings. The poor of our township are kept in Alexandria township on a farm, and are well taken care of. Cemeteries are all in good shape, burials properly conducted. Public health remarkably good. Have had some cases of typhoid fever and diphtheria. Cases have been isolated as far as possible, rooms thoroughly fumigated after termination of cases. Board has done nothing except to organize. The executive officer of the Board has listened to a few, very few, complaints, and attended to them individually.

KINGWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. B. Chamberlain, Baptisttown; George Striker, Baptisttown; George E. Dalrymple, Baptisttown; George Kugler, Tumble. E. D. Leidy, M.D., Health Inspector.

Kingwood township is situated east of the Delaware river, with a population of about 1,400. The land rises abruptly near the river from 300 to 400 feet. It is mostly level, except in the western and southwestern portions, where it is very hilly.

The water-supply is entirely from wells and cisterns. Drainage is natural. The school-houses and grounds are kept in good, healthy condition. Our poor are kept at the township alms-house, and are well cared for. The old grave-yard at Baptisttown is very much neglected. There are few interred, but, owing to the location, the Board of Health has ordered that there be no more burials in this yard. Heating houses by stoves is the rule. The ventilation of many homes is bad.

La grippe, with its complications, prevailed during the winter, with greater fatality than at any time during its invasion. Pneumonia was the principal complication. During the spring months of 1892, measles, in a severe form, were epidemic. There were a few cases of scarlet fever and diphtheria during the summer. This section has been almost exempt from bowel troubles during the present summer.

CITY OF LAMBERTVILLE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Gervas Ely, President; J. L. Coryell, W. A. Cole, J. A. Horn, Dr. P. McGill, G. L. Swallow. W. H. Wilmot, Clerk. Post-office address of all, Lambertville.

Very few basements; good cellars; only one family in a house; rigid house-to-house inspection this year.

No new manufactories. The rubber-reclaiming factory mentioned in last year's report sometimes sends out an offensive smell across the city when the wind happens to be in the right direction.

Scarlatina; about 40 cases in all since the last report.

Have had a thorough house-to-house inspection, resulting in a general cleaning up. When contagious diseases have occurred they have been promptly reported, and the places as promptly quarantined and a card placed on the house announcing the kind of disease within.

Have had an analysis made of the water supplied by the water company. Articles in regard to cholera have been published in both city papers. The items omitted from this report are such as have been reported in previous years, and are on file in your office.

LEBANON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Hipp, Glen Gardner; Joseph Fritts, Glen Gardner; Andrew C. Cregar, Califon; A. S. Banghart, Secretary, Glen Gardner.

I have nothing new to report to you. Our township has been very healthy for the past year. No contagious diseases of any kind have existed in our township. Our poor-home is kept very clean and is greatly improved. Our Board of Health has not organized for two years.

A. S. Banghart,
Secretary.

RARITAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. L. Thatcher, President; E. S. Wyckoff, Nelson Moore; A. J. Green, Secretary. John H. Ewing, M.D., Health Inspector. Post-office address of all, Flemington.

During the fall and winter we suffered severely from la grippe, complicated, in a number of cases, with pneumonia. From this cause our death-rate has been higher than usual. We also had a few cases of diphtheria and a few deaths, still hardly sufficient to be called epidemic. The Board has met once a month from May to November, and has heard a number of minor complaints and ordered them abated. We have made no special arrangements to treat cholera.

Andrew J. Green,
Secretary.

READINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. W. Pursell, M.D., White House; Cyrus A. Conover, White House; D. T. Stryker, Secretary, White House; John Y. F. Schomp, White House; George W. Cole, Chairman, Pleasant Run.

The Board has held two meetings since last year. At a meeting in November, we adopted a code of ordinances. The township is in good sanitary condition. We have made no preparation for cholera cases. Scarlet fever was epidemic last fall and winter, about fifty cases and but two deaths. The early part of 1892 la grippe was very prevalent, but the death-rate was low. We also had several cases of measles during the winter months.

D. T. STRYKER,
Secretary.

TEWKSBURY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Abraham A. Alpaugh, Cokesbury; Austin Clark, New Germantown; Harmon Sutton; Califon; David C. Farley, Assessor, Mountainville. Theodore Miller, M.D., Health Inspector, Califon.

The Health Board of this township is well organized. There have been no complaints made during the last year. The population remains about the same as last year. Our township has been blessed with good health. No contagious diseases in the township in the past year. No important changes from report of last year.

DAVID C. FARLEY,
Secretary.

UNION TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. A. Dalrymple, Pattenburg; James H. Exton, High Bridge; N. B. Boliean, M.D., Jutland; Sylvester Taylor, Pittstown; Morris Stockton, Pattenburg, Clerk.

The Medical Member of the Board states that the health of the township is at present good. No contagious disease of any kind has existed during the year. Our Board is well organized, and every precaution is taken to keep things clean and healthy. Our last meeting was held on October 8th, 1892.

MORRIS STOCKTON.

WEST AMWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. H. Fisher, President, Lambertville; John B. Drake, Lambertville; Joseph K. Leigh, Lambertville; George E. Van Buskirk, Secretary, Lambertville; Dr. William Radcliffe, Woodsville, Mercer County.

Cellars are usually drained. Nearly all houses have cellars, which are used for storing fruit and vegetables in winter. There is no yearly house-to-house inspection. There has been no prevalent disease among the people or among the animals. The last meeting of the Board was held September 19th, 1892, when they inspected a house occupied by some Italians. They found it in a filthy condition and ordered it thoroughly cleaned.

GEORGE E. VAN BUSKIRK,
Secretary.

MERCER COUNTY.

EAST WINDSOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

No names received, but the Township Clerk reports that the conditions are healthful. (See report of Hightstown Board in this township.)

EWING TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Maple, President, Ewingville; John R. Hendrickson, Ewingville; James F. Herbert, Trenton Junction; Harry L. Cornell, Clerk, Ewingville.

Ewing township adjoins the city of Trenton, in Mercer county, on the north. Its water-supply is from running streams, springs and wells. The natural drainage of the township is good, and there is little stagnant water, with the exception of the mill-pond of Charles Keeler. A number of the streets of the city of Trenton extend into the township. Hillcrest and the Cadwalader property have streets laid out and graded, and built on to some extent, and a number of private properties at Trenton Junction and in the vicinity of Trenton have been laid out in building lots, and maps filed, showing streets, &c. Cadwalader Park, a public park owned by the city of Trenton, is located within the township limits, and the New Jersey State Lunatic Asylum and Reform School for Girls, are also in the township.

No system of sewerage has been adopted. Cesspools are built with open bottoms, cleansed about twice a year, and the contents carted upon the land and turned under.

Ewing township depends principally upon Trenton for her markets, although part of her produce is shipped to New York and Philadelphia. There are no market-houses in the township. There were no contagious diseases in the township during the year, excepting a few cases of diphtheria last spring, in that portion of the township immediately adjoining the city of Trenton.

There are but two slaughter-houses in the township, both small, and in good sanitary condition.

There are six public schools in the township, all in good condition.

The City Hospital and Odd Fellows' Home are located within the limits of the township. The cemetery of the First Presbyterian Church of Ewing is the only cemetery in the township.

A code of laws was adopted by the Board of Health, and the requirements are carried out. The vital statistics are collected by the Clerk of the Board of Health, in his capacity as Assessor of the township. Arrangements have been made to quarantine in cases of contagious diseases.

The dwellings are heated with stoves and heaters.

Health in the township is generally good, and has been during the past year.

HARRY L. CORNELL,
Clerk.

HAMILTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. George R. Robbins, Hamilton Square; Richard Hunt, Trenton; David Lee, Hamilton Square; Thomas Applegate, Allentown; William A. Blake, Allentown, Secretary.

We have had but two complaints this year, the one in connection with the soap-house of O. F. Niedt, which has since been removed, and the second in connection with the boiler-house of Jacob Kafes, which nuisance has also been removed. In reply to question of Circular No. 45, would say we have taken no action in reference to cholera. Should we have a case, our means that are available are such as are found in every township. Our Township Board of Health met the last time on July 23d.

WILLIAM A. BLAKE,
Secretary.

HIGHTSTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Cole, A. M. Taylor, Lewis G. Messlor, T. W. Pullen. Joseph W. Warwick, Health Inspector. Post-office address of all, Hightstown.

Hightstown is situated in the central part of New Jersey on the Camden and Amboy branch of the Pennsylvania railroad. The population is about eighteen hundred. Climate temperate. Our water-supply is obtained from wells entirely. We have no sewerage system, though Grape run, a small stream running through the central part of the town, is used as an open sewer. Many complaints have been made owing to the upper part of the stream being dammed up to obtain water for sprinkling the streets. An examination of the stream has been made. The case will be brought up at our next meeting and the dam probably ordered removed. Our streets in the main are good. No tenement-house is occupied by more than two families. Our light is obtained from kerosene oil. All excreta is removed and covered with earth. Refuse is collected by wagons and there is no accumulation. No markets.

No contagious disease among animals has heen reported. There are two slaughter-houses allowed to be kept within the borough limits; during the months of July and August they are used very little. We have one shoe and one shirt factory. Schools include a large boarding school for both sexes, Peddie Institute, and one public school. No alms-house; our poor are distributed among different farmers by the Overseer. Cedar Hill Cemetery is well managed by an efficient Board of Directors.

Public health good, with no epidemic during the year. Every case of contagious disease existing in a family is promptly quarantined. Vaccination not compulsory. Buildings are heated by hot-air furnaces and stoves.

W. J. WARWICK,
Inspector.

HOPEWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. R. Voorhees, Harbourton; J. P. Hart, Pennington; I. G. Howell, Hopewell; William D. Hill, Glenmore. William M. Radcliffe, M.D., Woodsville, Health Inspector.

Hopewell township occupies the northwestern portion of Mercer county, being about one-fourth of the entire area; land rolling, a great portion being mountainous; drainage good; has two small towns, Hopewell and Pennington, and four villages, the former being incorporated under the Borough act. This township is a very healthy locality. Many springs of the finest soft water exist, furnishing water for farm and town use. Our schools, high and public, are among the finest, being well managed as to health and comfort. The township's Board of Health met and organized in August, appointing its officers; adjourned to meet on call of its President. Attention of Township Health Inspector was called to foul conditions existing at the tomato canning factory of Hopewell, which were promptly attended to. Attention was also called to uncleanliness existing at our new county farm, which, on examination, proved false. Scarlet fever prevailed in the northern portion of the township in May last. No fatal cases. Three cases of diphtheria were reported in one family, which proved fatal; cause, impure well-water. One case of typhoid fever, not fatal; cause, impure well-water. No contagious diseases among animals reported.

WILLIAM D. HILL,
Secretary.

LAWRENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel Van Cleve, Lawrenceville; James W. Phillips, Trenton; Clark Flock, Lawrence Station; Isaac B. Baker, Secretary, Lawrence Station. Dr. Edmund Dewitt, Physician, Lawrenceville.

There have been no epidemics in our township this year. We know of no year when our township has been so healthy as the past one.

ISAAC B. BAKER,
Secretary.

PRINCETON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. B. Bayles, E. G. Warren, H. E. Hall; W. M. Wright, Secretary. Dr. E. H. Bergen, President and Health Inspector. Post-office address of all, Princeton.

The Board has regular monthly meetings. We are organized according to the State law. The general health of Princeton township during the past year has been good.

PRINCETON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. E. H. Bergen; Prof. H. B. Cornwall, College Chemist; Prof. W. F. Magie, A. L. Rowland, T. R. Hartpence; H. H. Farr, Secretary. Jared D. Wolf, Sr., Inspector. Post-office address of all, Princeton.

Situated on a line between New York and Philadelphia, three miles from main Pennsylvania railroad line, and about half distance between the above cities. Water-supply mainly from artesian wells and a small number of ordinary wells. Sewer undergoing construction. Garbage, waste matter, &c., carried away by persons employed to do such work, both by private and public appropriation. No epidemics. No slaughter-houses within borough limits.

Regular monthly meetings on first Monday of each month; special meetings at call of President; Health Inspector constantly on duty; public nuisances in all cases abated as far as possible.

CITY OF TRENTON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

G. D. W. Vroom, President; William Cloke, Secretary; Thomas S. Chambers, Treasurer; Dr. C. Shepherd, Carroll Robbins, S. Walker, Jr., George W. McGuire. Alfred W. Packer, Health Inspector. Post-office address of all, Trenton.

I inclose herewith a detailed statement of the operations of the Trenton Board of Health for the past year, prepared by Mr. Packer, the Inspector.

WM. CLOKE,
Secretary.

Work done by the Board of Health of the city of Trenton, from October 1st, 1891, to October 1st, 1892:

I called the attention of the Board of Health to the bad manner in which the garbage collectors dispose of their garbage. The Board, since that time, has been trying to devise some plan whereby all garbage could be removed from the city, but have only partly accomplished it. I think the proper thing for the Board of Health to do is to advise the city to establish a crematory.

The Board is very much handicapped in the matter of sanitary plumbing, as it has never adopted the Plumbing law of 1888.

I asked the Board of Health to have a committee appointed to confer with the Governor of the State concerning the emptying of water-closets into Petty's run, creating a fearful nuisance at the mouth of said run. After the committee's conference with the Governor, the State authorities decided to connect with the sewers on West State street, which they have done, and this relieves this portion of the city very much.

From October 17th, 1891, to April 1st, 1892, we have had 104 cases of small-pox—adults, 34; children, 44; infants, 26. Of this number we have had 19 deaths, all of whom were buried by the Board of Health, with but two exceptions. Death-list—adults, 10; children, 5; infants, 4. During the prevalence of this disease we used disinfectants as follows: 1,000 pounds of powder disinfectant, 550 pounds of roll sulphur, 6 barrels of liquid disinfectant, 6 dozen sulphur candles, and a number of gallons of Pasteur's pine lotion, half a pound bichloride of mercury. A number of the small-pox patients were treated at the city small-pox hospital, which is situated about three miles outside of the city. The place is small but in good condition. The city has a property there of nine acres, and the Board will have another building erected there this fall.

During the epidemic of small-pox in this city, just outside of the city limits there were nine other cases of small-pox which the Board of Health did not directly deal with.

We have made a number of raids upon butchers, concerning their slaughter-houses. Where we found them killing their stock upon wooden floors, we made them put in an asphaltum floor, which in every instance has proved satisfactory, and in a number of cases we have had cesspools put in where they had no place for their refuse sewage to flow.

The scavengers have removed this year, from vaults and cesspools, 53,000 barrels, or 1,590,000 gallons, or 9,275,000 pounds, or 4,637½ tons. This matter is all carried outside the city limits and made into compost by the farmers. Our scavengers are all licensed men and experts at their business.

I have received a number of notices from the State Board of Health concerning immigrants who land here from different foreign vessels. We have been very busy in finding out the locality of these people, and we have found all in this city with the exceptin of one, and I found that he did not come here, but went to Bristol, Pa.

The Board of Health have been instrumental in having, in the outlying districts of the city, the proper grades established—curbed and guttered—putting those places in a much better sanitary condition than they have been for years. Where the streets were formerly filled with stagnant pools of water they are now in a good condition, thanks to the Board of Public Works for attending to this matter so soon after being notified by the Board of Health.

We have been called upon to fumigate a number of houses where children have died of diphtheria, which we do in every case when asked so to do.

We have during the past year taken out a number of old wells used as cesspools, under the sheds and kitchens of houses. We have caused some fifty of these cesspools to be cleaned out and filled up.

Have had analyses of twenty wells of water, and the result proved that the water of all was bad. We have had all of these wells closed.

We had also a number of streets in the city reported to the Board of Public Works as being in a bad sanitary condition.

I have had a number of complaints of the soap-works on Union street. The nuisance complained of in this place was the rendering of old fat. I was instructed to proceed against the owner of this place, and I notified to that effect; since that time he has ceased rendering.

I visited the school buildings and found them kept neat and clean, and all were in a very good sanitary condition. I also visited the fire department engine-houses, and found they had adopted suggestions made by the Board of Health, and they are in first-class sanitary condition.

Total number of Notices by mail	938
“ “ “ “ Personally	356
“ “ “ House inspections	2,359
“ “ “ Complaints	610
“ “ “ Scavenger permits	2,279
“ “ “ Diphtheria cases	314
“ “ “ Scarlet fever cases	170
“ “ “ Typhoid fever cases	45
“ “ “ Small-pox cases	110
“ “ “ Measles cases	11

A. W. PACKER,
Health Inspector.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Coleman, Windsor; Forman Hutchinson, Windsor; Harrison Yard, Robbinsville; George A. Silver, M D., Windsor; J. P. Hutchinson, Secretary, Windsor.

The usual water-level is such as to secure dry cellars. There are no swamps of any size and the township is very free from malaria. Houses mostly have cellars; they are largely used for vegetables. No houses of more than two families, and very few with more than one. There is no yearly house-to-house inspection.

In February and March we had four cases of small-pox, and in June and July scarlet fever in two families; nine cases in all, with two deaths.

One slaughter-house, which is kept in the very best possible condition. We have two school buildings, both in first-class order in every way. Only one small cemetery in the township.

The Board has not passed ordinances. Contagious diseases are treated in their own homes. The children were nearly all vaccinated last spring. The Township Physician vaccinated each scholar in both schools. No prevalent disease.

WEST WINDSOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob R. Wicoff, Dutch Neck; David D. Bergen, Princeton Junction; William J. Tindall, Edinburg; Dr. G. H. Franklin, Hightstown; S. Judson Allen, Lawrence Station.

The Board has no report to make.

S. J. Allen,
Assessor.

WILBUR BOROUGH.

I beg to inform you that we have no Board of Health; there not being the requisite number of inhabitants to necessitate the appointment of such Board according to law. There has never been any report issued from this borough.

Charles H. Christopher, Olden avenue, is the Chairman of Sanitary Committee.

C. Ernest Fox,
Borough Clerk.

MIDDLESEX COUNTY.

CRANBURY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Sylvanus Grover, President, Plainsboro; W. Elmer Bergen, Cranbury; John M. Chamberlain, Cranbury; Frank A. Brown, Secretary, Cranbury.

All drainage in first-class condition. Houses generally occupied by owners or good tenants. Refuse buried or spread on land and plowed under. No disease among animals. Only one slaugher-house and that isolated. Schools and school buildings in first-class condition.

Cemeteries in good condition. Public health good. No ordinances passed. Vital statistics usually returned promptly. No prevalent diseases. Have nothing important to report, as everything seems to be in good condition. No complaints made to the Board.

F. A. BROWN,
Assessor.

EAST BRUNSWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John O. Cozzens, Spottswood; John H. Perden, Milltown; Conrad Kohlhepp, Milltown; George Roeder, Assessor, Milltown; Stephen M. Disbrow, M.D., Old Bridge; David Serviss, Town Clerk, South River.

The township of East Brunswick is located near the center of the county of Middlesex; had a population of 3,697 in the census of 1885, which has increased steadily, but not rapidly, since that time. It embraces within its limits the town of Washington (South River P. O.) and the villages of Old Bridge, Spottswood, Helmetta and South Milltown. The town of Washington has a Local Board of Health, which looks after its sanitary affairs. About one-half of the population of the township live within the limits of said town. With the exception of the villages named the township is a farming community.

The land is sand loam and generally fertile; it is slightly rolling and drained by brooks. The boundaries of the township are mostly watercourses; Ireland's brook and Lawrence brook, which empty into the Raritan river, forming the western boundry lines, while Manalapan river, Matchaponix brook and South river, which also empty into the Raritan river, form the southern and eastern boundaries, and the Raritan river forms the northern boundary line of the township. There is no artificial drainage, except for the improvement of farming lands, and no sewerage. The streets or roads are generally good, except in very sandy places, and are made of soil or gravel.

The houses are mostly frame and are generally owned by the occupants thereof, and are generally lighted by kerosene lamps. There are no public markets in the township. The township, during the past year and longer, has been remarkably free from animal diseases.

The slaughter-houses within the township are well managed and kept in good condition. The manufacturies are brick, snuff, tobacco, shirts, handkerchiefs and drugs. The mills are kept in good condition and the sanitary condition is good.

The school-houses, of which there are nine, are in good condition and well looked after by the School Trustees. There are no almshouses, hospitals or other charities within the township. There are five cemeteries, two of which are in the town of Washington. They are all well kept, except one in the town of Washington, in which no burials are now made. The Township Board of Health has not adopted any ordinances, but the Board of Health of the town of Washington adopted a code of ordinances.

The township has been free from contagious diseases during the past year, with the exception of a few cases of dysentery at Helmetta, which were not brought to the official notice of the Board of Health.

The Board has not been called out during the past year, but has met to look after the interests of the health and sanitary condition of the township several times, the last meeting being held September 18th, 1892.

The township has no hospital or vacant house to transfer cases of cholera to, but would lose no time to secure a place when the occasion required it. We would also secure a disinfecting corps and nurse at the same time. There are no places, except in the town of Washington, within the township, to which such cases might come, except such as are watched.

DAVID SERVISS,
Secretary.

MADISON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alexander Gastan, Cliffwood; James Fountain, Inspector, Old Bridge; Cornelius Burlew, Old Bridge; John C. Dill, Old Bridge; Stephen M. Disbrow, M.D., Old Bridge; D. H. Brown, Assessor, Old Bridge.

The Board of Health of Madison township reports as follows: The people depend entirely upon wells for water; cisterns are used very little. Drainage is exceedingly good throughout the township. A majority of the school-houses have been rebuilt during the past year, affording better comfort and ventilation to the scholars. Have had no contagious disease except scarlet fever last spring, which was fatal in three instances. The condition now of the township is good—have never known it to be better than at the present time.

D. HALSTEAD BROWN,
Assessor.

MONROE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel Butcher, Hightstown; Alfred Davison, Jamesburg; C. S. Young, Jamesburg; Charles G. Hoffman, Jamesburg.

There is no report from our township this year.

NEW BRUNSWICK CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Henry R. Baldwin, President; H. B. Willis, Esq., Secretary and Treasurer; Dr. A. Van Nest Baldwin, Inspector and Secretary; Dr. C. H. Voorhees, Edward Tindell, Esq., Dr. S. A. Shannon, Geo. J. Litterst. Post-office address of all, New Brunswick.

The health of the city has been very good during the year. In the months of February, March, April and May we were visited with an epidemic of scarlet fever, which was very mild indeed, there being only 6 deaths out of a total of 149 cases.

The number of cases of diphtheria has been small, but it has proved quite fatal, there being 12 deaths in 31 cases.

Measles have been very rare, only 7 cases being reported, and no deaths.

Typhoid fever has not been at all prevalent, as only 17 cases were reported. Yet in the report of the City Clerk 10 deaths are recorded.

We have had one case of cholera, the full report of which will appear hereinafter.

This Board has endeavored to keep in readiness for sudden invasions of disease, as well as to use such measures as will prevent their development in our district.

The city had formerly a pest-house, which was found from location and other reasons undesirable. It is now in contemplation to dispose of it. If occasion should arise the Board feels confident that such

Hospital can be secured as will meet the demands, and that attendants, both for nursing and disinfection, will be readily found. Our city has been thoroughly disinfected throughout the whole season. A solution of bromine, and sulphate of iron has been used to a moderate extent, and the Board has an adequate supply of each. When the cholera was in the port of New York, the Board thought best to issue a circular for the safety of the citizens, a copy of which is submitted. It is not claimed that the work of the Board has been perfect, but the members of our organization have been faithful and assiduous in their efforts to protect the important and serious trust (the public health) which has been committed to our care.

Hereto appended is the record of a case of cholera which was brought from New York.

On Sunday, September 18th, at 9:30 A. M., Dr. Van Nest Baldwin, while making a professional visit, was asked to see a man named James Carr, lying sick at 13 John street. This man had arrived in New Brunswick on Friday evening from New York from his canal boat, which had been lying at the foot of Thirtieth street, North river, for over one month. She was loaded with soft coal.

Carr lived upon his boat most of the time, and when in the city confined his wanderings to the district bounded by Twenty-eighth street, Tenth avenue and Thirty-sixth street. He was a hard drinker, of phthisical heredity. When seen on the 18th inst., he was cerulian in color, pulseless, eyes deeply sunken, flesh shrunken, and almost voiceless. He had been taken sick about 10:30 on Saturday evening, and had violent purging and vomiting during the night, with accompanying cramps, resulting in collapse in less than twelve hours. Death resulted at about 6:30 P. M.

Upon visiting this case, immediate steps were taken to prevent any spread of the disease. The family were ordered into the upper part of the house, and immediate quarantine insisted upon. The premises were disinfected by a strong solution of bromine, the bedding and floor treated with solution of bichloride of mercury, one to five hundred, and carbolic acid five per cent. After the death of the patient, the whole of the bedding, carpets and fabrics capable of infection were burned. The body was encased in a blanket saturated with a solution of mercury bichloride, one to two hundred and fifty, and buried. The apartment where death occurred was thoroughly fumigated with sulphur, and the floor and casements washed with bichloride solution and five per cent. carbolic solution. The quarantine was continued for twelve days. No succeeding case occurred. The Board telegraphed for bacteriological test to New York City Health Board. Dr. Woolyon was sent out, who took specimens of the dejecta for examination, and the report was received that the spirillum of Asiatic cholera was found.

In the meantime, by the energy of Mayor Van Cleef and the prompt action of the Common Council, a temporary hospital and tents were improvised to meet emergencies, and circulars of information spread throughout the city.

A. VAN NEST BALDWIN,
Inspector.

NORTH BRUNSWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edwin Allen, New Brunswick; Howard De Hart, Milltown; Harry Denison, New Brunswick; John Bodyne, New Brunswick. Ferdinand E. Riva, M.D., Health Inspector, Milltown.

Bounded on the north by city of New Brunswick, on south by East Brunswick township, on west by Somerset county, and on east by East Brunswick and South Brunswick townships. Population, 1,800 to 2,000. Climate, temperate. Clay, sand, loamy soil. Water supplied by wells. Natural drainage. Houses are frame and occupied by owners. No diseases of animals have prevailed. There is one slaughter-house. The public health has been good. Vaccination looked after. The Board met September 28th, 1892, and then the matter regarding Denizer slaughter-house as a nuisance was argued, which it was decided to proceed against. The rest of the township has been looked after, but nothing has existed so as to require enforcement of the law, nor the inspection of any part of it, excepting the slaughter-house and tallow and hide manufactory. Steps have been taken by the Board to prevent further slaughtering at the establishment above named.

PERTH AMBOY CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Frank B. Morris, President; Hon. Patrick Convery, James L. Compton, W. Guy Weaver, Herbert Dayton, William E. Ramsay, M.D.; St. George Kempson, Secretary. William A. McCarthy, Inspector. Post-office address of all, Perth Amboy.

Location of Perth Amboy. It is situated on one of the best harbors in the world. Ships with a draught of twenty-four feet can be brought into our port. The population of the city is estimated at nearly 12,000, an increase of almost 100 per cent. in ten years. The climate is mild and healthful.

Geological formation. Clay is the principal ingredient of the soil. The town's situation is highly picturesque. It is peninsular in form, its borders being washed by the waters of Arthur Kull sound and the Raritan bay and river, by which it is almost entirely encircled. It commands a magnificent expanse of water view, and affords many attractions as a place of summer residence. Its advantages as a manufacturing center are also more than ordinary.

Water-supply. This has been a serious question with us for a number of years. Practically our citizens have had no water which has been absolutely pure. In the fall of 1890 the people adopted the act of 1876, allowing the establishment of the new water-supply. During the past year the city has purchased lands and water-source, and pipes are now being laid for carrying the water from Tennnet's brook, a point some eight miles from the city, crossing the river. The city has also purchased the plant of the Perth Amboy Water Company, which has been supplying the city during the past ten years. Our natural drainage is good.

Sewers have been laid to such an extent that nearly all the principal streets are well drained. We have not as yet, however, any system of sewerage. The matter of adopting a sewerage map is under consideration at the present time. It is estimated that over three miles of sewers were laid during the past year, and contracts have lately been made for at least another mile.

A serious problem that confronts the people at the present time is the condition of our streets. About a mile of Telford pavement has been laid during the past year. We have in all, perhaps, about three miles of Telford pavement within the city limits. It is considered by the Local Board of Health that the opening of certain streets is absolutely necessary to public health.

The houses of Perth Amboy are generally of the medium class, and owing to the character of our industries we have a great many tenement-houses, and they are closely crowded. There is not a house to rent in the city.

Our city is lighted by gas for private use, and incandescent and arc lights for public use. The light is furnished by private corporations.

The refuse and excreta are collected by the Street Commissioner, and are used for filling up vacant lots. Other excreta is disposed of by the scavengers who are licensed by the Board of Health.

We have some slaughter-houses within the city limits, which have caused us considerable trouble.

There are no diseases of any account among animals in our city.

Terra-cotta and brick manufactories, machine-shops, dry-docks and ship-building and coal-shipping make up our principal lines of trade.

We have three public schools belonging to the city, besides a number of private schools and a Catholic school. We consider that our schools are second to none in the State.

We are using as our alms-house an old building which is rented for the purpose. Under the advice of the Local Board of Health the city has purchased a lot of ground, upon which it is proposed to build an alms-house during the coming year. There is a private hospital association.

The police force consists of a Chief, roundsman and four patrolmen.

We have three cemeteries.

Generally the public health has been remarkably good, considering the condition of the streets and the water. The Local Board of Health has adopted every precaution in the way of ordinances, rules and regulations, and has been most vigilant in protecting the public health during the past year.

Under the rules of the Board of Health every case of contagious disease must be reported to the Board. In case of death the Inspector directs that the funeral be held privately.

Sanitary expenses have been somewhat heavy on account of the cholera scare. The Board of Health employed a number of men during the prevalence of the cholera in New York bay. Every street was scoured and every gutter cleaned, and the city kept in a condition of cleanliness.

The prevalent diseases of the year have been scarlet fever, diphtheria and typhoid fever.

The Board of Health has held monthly meetings during the winter, and during the summer it has met twice a month. During the past summer, however, the meetings were held nearly every week. Additional Inspectors were employed to make a house-to-house iuspection during the threatening of the epidemic.

ST. GEORGE KEMPSON,
Secretary.

PISCATAWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.*

Alvah Gray, Dunellen; Simeon R. Dayton, New Market; Firman Walker, New Market; A. S. Coriell, Assessor, New Market; W. J. Nelson, M.D., New Market.

The Board of Health met and organized last spring, after town election. Further than that there has been nothing done, as the health of the community has been good, there having been no epidemics of any kind since the last one of la grippe, and but very few complaints of nuisances, all of which have been abated without trouble.

W. J. NELSON, M.D.

RARITAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. W. McGann, Highland Park; William McAdams, Metuchen; Luther H. Tappen, Metuchen; Theo. A. Wood, Secretary, Metuchen; A. Clark Hunt, M.D., Metuchen. Theo. A. Wood, Health Inspector, Metuchen.

No public water-supply. No sewerage. No public grounds.

Houses principally occupied by the owners. Streets not lighted.

But one slaughter-house, which is kept in good order.

Eight school-houses; are kept in good order.

Four cemeteries; all kept in fair order.

Code adopted and health laws enforced.

No quarantine or provision for contagious diseases.

It has been an unusually healthy year.

Work done is as follows: 12 cesspools ordered cleaned; 10 drains ordered cleaned; manure and filth removed from 15 stables; 30 privies ordered cleansed and improved; 10 yards cleaned and filth removed; 6 dead animals buried.

The above work done without expense to township, under orders from Inspector. Metuchen now in a good sanitary condition.

THEO. A. WOOD,
Inspector and Secretary.

SAYREVILLE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. N. Blew, Chairman; J. H. Beekman, M.D., James Hansen, Leferts Smith, John Quade. C. Albert, Health Inspector. Post-office address of all, Sayreville.

There is nothing special to report on this year. The Board is not as active as it might be. Several nuisances have been abated which were reported to the Board. We have been free from all epidemics.

SOUTH AMBOY BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hon. D. C. Chase, President; Councilmen, J. H. Gordon, J. H. Greene, Stephen Martin, Ward C. Perrine, John Scully, Bernard Roddy; Wm. Birmingham, Secretary. Wm. Minnick, Health Inspector. Post-office address of all, South Amboy.

Everything possible has been done to keep the borough in a good sanitary condition during the past year.

WM. BIRMINGHAM,
Secretary.

SOUTH AMBOY TOWNSHIP.

As this township is nearly all within the borough limits, no special report is made.

SOUTH BRUNSWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. D. Britton, Chairman, Plainsboro; D. C. Griggs, Dayton; John G. Wilson, Dean's; G. D. Van Derveer, Dayton; Edgar Carroll, M.D., Dayton; F. G. Stevenson, Secretary, Dayton.

There is nothing new to report. Our township seems to be in a healthy condition. There have been no complaints to the Board of Health of any kind, and no contagious diseases to any extent during the year.

F. G. STEVENSON,
Assessor.

WOODBRIDGE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. D. Brown, Chairman; A. R. Berry, Secretary; Dr. S. E. Freeman, Jonas H. Coddington, Franklin Moore.

MONMOUTH COUNTY.

ATLANTIC HIGHLANDS.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Rev. Dr. Edward C. Curtis, President; Dr. John H. Van Mater, Dr. George D. Fay, Treasurer; Dr. H. A. Hendrickson, William T. Franklin; James H. Leonard, Secretary. Somer T. Champion, Health Inspector. Post-office address of all, Atlantic Highlands.

Located on Sandy Hook bay. About 2,000 resident population. Climate moderate; no snow. Gravelly soil down to springs. Rolling ground, from 10 to 150 feet above sea-level.

Water-supply from individual wells. Have just adopted a plan for water-supply and sewerage; voted for the same unanimously; will have both completed by June 1st, 1892; present accommodations imperfect.

Streets fifty feet in width; ten-foot sidewalk through main street; flagging for most part, remainder gravel; plank and stone curbing. Houses occupied mostly by their owners. Gasoline and kerosene lamps are used for lighting streets.

Garbage and refuse carted away by a contractor each day. Odorless excavators used for cleaning vaults and cesspools. Animals comparatively healthy.

One large public school, accommodating 150 scholars; three private schools besides.

Fine large cemetery just out of city limits, containing fifty acres. No contagious diseases, except two or three brought here from New York City. As to quarantine accommodations, we have one just under our nose on Sandy Hook, that will ruin our fair town unless it is removed for good and all.

It has been a healthy year here. Every complaint has been examined into by the Inspector, and in several instances where the owners of premises refused to remove nuisances they were fined. No garbage allowed to accumulate; closets kept in cleanly condition; cesspools emptied at proper time, except in one or two instances; no offensive slops allowed to run in the avenues. During the existence of the quarantine a patrol was kept to guard the shores; bedding and refuse from the vessels immediately removed; the greatest exertion in trying to quiet the fears of summer residents as to the quarantine near our shores, but some families moved away notwithstanding.

House-to-house inspection was made by the Inspector, and the result proved to be very beneficial. Only part of the cesspools were entirely water-tight, as some were improperly constructed before the Board of Health was organized; but as the sewer system will do away with the cesspools, we will have no trouble in that direction hereafter.

J. H. LEONARD,
Secretary.

ASBURY PARK.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. D. Pennypacker, President; J. A. Bradley, David Harvey, Jr., N. E. Buchanon, John Rockafeller, T. F. Appleby. E. Wright, Inspector; David Bowen, Assistant Inspector, Clerk and Recorder of Vital Statistics. Prof. A. W. Ogden, Chemist. H. Mitchell, M.D., Advisory Physician.

Asbury Park is located on the Atlantic coast, about two miles south of Elberon, and is separated from Ocean Grove, on the south, by Wesley lake. The climate in summer is much cooler than in inland cities, and averages much warmer in winter. Our population varies so that an exact census can scarcely be given, but if a monthly census was taken during the year of the permanent and transient population and divided by twelve, it would make our population average over 15,000.

The public artesian water-supply continues satisfactory in quality, as the late analysis has proved, but owing to the increase of our population, the quantity was not as abundant as desired for all purposes during July and August. There have been 48 water connections made this year, making a total of 873. The water from 29 surface wells has been analyzed this season, 9 of which were found polluted, and closed.

The sewers have continued to do their work satisfactorily; no annoyance has been caused by them. During the year 18 sewer connections have been made, making a total of 823. The contract for the removal of garbage and refuse amounted to $3,000; the contractors have given good service, causing but few complaints.

Frequent house-to-house inspections were made, and a complete set of street books are kept, one for each street and avenue, in which the sanitary condition of all premises is recorded. These records can be seen by calling at the office of the Board.

Sixty-eight plans of plumbing-work have been examined, tested and approved this year.

Eleven cases of contagious diseases have been reported, *i. e.* four cases of measles, three cases of scarlet fever, and four cases of diphtheria, three of which proved fatal.

Sixty-six deaths were recorded during the year, 30 of which were of transient visitors, and 36 of the resident population.

W. D. PENNYPACKER,
President.

ATLANTIC TOWNSHIP.

No report received.

MANASQUAN TOWNSHIP.

We have had no Board of Health in the borough during the past year. One has, however, recently been appointed, and J. B. Wainright, M.D., of Manasquan, appointed Clerk.

Members of Council as follows: George Bailey, Mayor; F. S. Stines, James B. Hudson, W. Newbury, R. F. Longstreet, R. A. Vandusen, W. H. Ruf, Councilmen; all of this city.

Township Committee—Henry Wainright, Brielle; James L. Algor, New Bedford; F. P. Philbrick, Belmar.

E. P. LONGSTREET.

BELMAR.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Crowell Marsh, President; F. P. Philbrick, Recorder of Vital Statistics; Joab Titus, William M. Bergen, James S. Huyler, Fred. V. Thompson, M.D. Charles S. Wolverton, Health Inspector. Post-office address of all, Belmar.

We have no report to make which would differ from the one of last year as to answering the above questions. Would say that the Board has, as far as possible in a town like ours, enforced the ordinances and has tried to keep the place free from nuisances and anything that would tend to breed diseases. We have done what we could to guard against any outbreak of cholera, and have a committe appointed from our Board which is co-operating with like committees of Boards of near-by towns in securing a suitable place to remove any one who might be stricken with the disease. Last meeting of the Board was on September 22d, 1892. Circular No. 45 was placed in every house in the borough.

NEIL H. MILLER,
Clerk.

EATONTOWN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. W. Crater, M.D., President and Inspector, Oceanport; W. R. Stevens, Secretary, Eatontown; R. F. Hopper, Eatontown; C. S. McFadden, Oceanport; D. S. Vannote, West Long Branch.

I can add nothing under the various headings to last year's report. This township is on a standstill, and has changed very little in any respect during my fifteen years' residence in it. There have been no epidemics of disease among men or the lower animals during the past year. There have been a very limited number of cases of diphtheria and typhoid fever, not over twelve or fifteen of both together. Many nuisances have been reported, investigated and abated. Cases of scarlatina and diphtheria have been isolated, and, after recovery, the apartments thoroughly disinfected by myself. We have had no cholera nor cholerine. In case a case should occur, I have a contract under which a building is to be erected and ready for occupancy within twenty-four hours, and every arrangement and detail is prepared. The members of the Board have put everything in my hands, and agree to whatever I say or do. This saves time and talking, and will probably prove satisfactory.

E. W. CRATER, M.D.

ENGLISHTOWN BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

I. A. Lockwood, President; Bismark Hoxie, Secretary; Elwood T. Reed, William E. Mount. G. H. Hutchinson, Inspector. Post-office address of all, Englishtown.

Surface drainage. One slaughter-house, well kept; one schoolhouse; one opera-house; public health good; laws fully complied with; no epidemics; all necessary precautions are used.

I. A. LOCKWOOD,
President.

TOWN OF FREEHOLD.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Bawden, President; A. C. Hart, O. R. Freeman, M.D., J. O. Burte, Jr., Theodore Fields. W. J. McClure, Health Inspector. Post-office address of all, Freehold.

The year just closing has witnessed some changes in our town which, it is hoped, are for our lasting advantage. The Board has met several times. Necessary inspection is given, and particularly when complaint is made. All nuisances are abated. The destruction by fire in July of stables caused the death of thirty-two horses and the offensiveness from the burning carcasses produced some alarm, but notice from this Board for their removal was promptly obeyed and most of the remains removed within twenty-four hours after the extinguishment of the fire, and the premises were thoroughly disinfected, so that no unpleasant odors emanated therefrom. Our water-supply continues abundant, giving general and increasing satisfaction, especially at this dry season, when wells are failing and there is a scarcity, and the need of wholesome water for all purposes is sorely felt. Up to the present time something near two hundred permits have been issued, and railroad companies and factories are being supplied, and it is also used for street sprinkling. Herewith please find statement respecting town sewerage. The work is progressing favorably with the mild and dry weather; the whole town is not under contract at present. It will probably be some time before it is completed and in operation, as the work must be tested and the disposal field put in order. In addition to sewerage, drain-pipes are being laid in the same trenches, intended to drain cellars that are damp and are flooded during wet seasons. What cesspools there are will probably be abandoned when the sewer system is completed. A good-sized addition is being built to the jail, which will be of great advantage, as quarters are very contracted for the increasing number of occupants. The health of the town continues good, with the absence of any prevalent diseases.

W. J. McClure,
Secretary and Inspector.

FREEHOLD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles D. B. Forman, A. J. Buck, Millard F. Conover, O. R. Freeman. Post-office address of all, Freehold.

The health of the township, outside of the incorporated borough, has been very good. No epidemic or contagious diseases to report. The only nuisances that have required abatement have been the keeping of hogs, and the using of the offal from slaughter-houses so near the limits of the borough as to become a nuisance, and requiring removal. The school-houses and cemeteries of the township are in good condition.

O. R. Freeman, M.D.,
Inspector.

HOLMDEL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

P. Conover Vanderveer, Wickatunk; Tennent Quackenbush, Marlboro; William Carson, Holmdel; J. W. Herbert, Wickatunk.

HOWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Lutz, Farmingdale; Charles Donahay, Turkey; Benjamin M. Cooper, Southard; James H. Butcher, Secretary, Ardena. Dr. Stephen A. Disbrow, Health Inspector.

We have nothing to report to you more than has been said in our former statements annually as to the different questions in circular. As you are aware, our township is large and not thickly settled, and no towns of any size. Our Board of Health has frequently met, and our medical member has carefully looked after any case brought to his notice that might prove detrimental to health.

JAMES H. BUTCHER,
Secretary.

MANALAPAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William H. Reid, Chairman, Tennent; David L. Applegate, Tennent; Daniel S. Aumack, Englishtown; S. C. Bown, Assessor, Englishtown; A. T. Applegate, Physician, Englishtown; J. C. Sutphen, Clerk, Tennent.

There is nothing new to report for the year.

WILLIAM H. REID,
Chairman.

LONG BRANCH CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Geo. W. Brown, M.D., President; E. B. Blaisdell, Clerk; J. P. Connolly, J. W. Taylor, M.D., H. H. Pemberton, M.D., Wm. J. Smythe, Jr., I. P. Goldy. H. R. Herbert, Health Inspector. Post-office address of all, Long Branch.

There has been no unusual prevalence of disease during the past year. All complaints made to the Board have been promptly attended to, and we are glad to state that the public are every year responding more promptly to the ordinances, and beginning to realize the importance of a Local Board of Health.

The attempt to locate the cholera patients who were quarantined in the New York bay, with the idea of being removed to Sandy Hook, near the border line of our township, created quite an alarm to our residents; but, thanks to the State Board of Health for placing patrolmen upon the beach for the purpose of burying everything which might be considered as coming from the cholera-infected ships, and also for the purpose of preventing the escape of any cholera patients from the location selected, we had but little trouble.

Another subject of importance to bring to your notice in this report, is one which has annoyed us for years. I refer to the dumping of garbage from the city of New York so close to our shore that our coast is frequently covered with it, and which involves quite an expense for its removal. I would recommend, therefore, that our State Board of Health communicate with the State Board of Health of New York, and ask that this refuse from such a large city be carried further to sea.

I have nothing further to report excepting to say that the incorporated districts which have special Boards of Health so nearly cover our township that our Township Board of Health has had but very little to attend to, but has acted in conjunction with the City Boards.

GEORGE W. BROWN, M.D.,
President.

NOTE.—Since this report was made the Board of Health of New York City says it has arranged for dumping garbage where it will give no further trouble along our shores.—H.

MATAWAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles E. Close, President; David G. Ryer, Edward Farry; Francis C. Bedle Assessor; William A. Rodgers, Secretary. Dr. C. Knecht, Health Inspector. Post-office address of all, Matawan.

The water-supply is from wells, springs and cisterns only, and usually good. This fall the majority of the wells are dry and others very low.

As to drainage, it is done by tile and terra-cotta pipe. The drainage is good. The land is rolling, and but few swamps where there is no outlet. In some sections in a wet season some of the cellars are wet. There is a meadow on each side of the thickly-settled portion of the township. There have been but few cases of malaria. Cellars mostly used for storage of vegetables of all kinds. There is no house-to-house inspection, only when and where necessary.

Some have private sewers for their own convenience. Some cesspools are all cemented and some are not. They are frequently pumped out and the contents put on the land or buried.

Slaughter-houses are looked after, so that there is no annoyance from them.

Our Board has passed ordinances. The Board of Health and Inspector have used every precaution as to the health condition of the township. Every complaint that has been made had immediate attention and the cause abated. In the month of September, during the cholera scare, the Board had notices published in our village paper, and circulars posted all over the township, setting forth the necessity for every inhabitant in the township to keep his premises clear of garbage or decayable matter of any kind. We also employed a man to patrol the beach and collect all articles of clothing, bedding or other thing suspected of coming from boats held at quarantine, and had such articles disinfected and burned. Everything is in good healthy condition and is constantly looked after by the Inspector and Board of Health.

WILLIAM A. RODGERS,
Secretary.

MIDDLETOWN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. A. Hendrickson, M.D., President; R. S. Snyder, Assessor, Secretary, George Morford, Jacob Swan and John J. Leonard, Township Committee and Associate Members. Post-office address of all, Atlantic Highlands.

The past year has been an exceptional one for this township. This Board has been called upon, first, to stamp out diphtheria at Navesink, which was threatening the whole community. The Medical Member and the Secretary visited the families, where several children lay sick and dying, and, while sympathizing with the afflicted parents, yet a sense of duty demanded that vigorous and stern measures be taken to prevent the dread disease from spreading to other families, by quarantining the premises where it was located.

and thoroughly fumigating all of the articles contained in the buildings where it existed. By so doing, the result (where the disease prevailed) was quick abatement of the fatal disease.

The Asiatic cholera cases on the ships lying in close proximity to the waters of Sandy Hook and Raritan bays, which break upon our shores, led the Township Board to employ patrols, at the expense of the township, to prevent bedding and other articles from the cholera ships from being used by the inhabitants living adjacent to the shores of said bays. A call was also made upon the State Board for additional patrolmen, which was promptly responded to by the Secretary of the Board. After several weeks of vigilant and untiring labors in preventing any family from handling the infected pieces thrown from the cholera vessels, providentially the Board ended its season without a single family being affected by cholera in the whole township. We now ask the State Board and the Executive to protest against the repetition of exposure of our suburban shores by the most vigorous expressions that can be made.

Excepting the foregoing, the township has been generally free from any prevailing disease or cause of ill health. Middletown township has a record of having more long-lived men and women in it than in any other section of the State. We have had several, until lately, that have lived more than a century. The healthfulness of our rolling lands is proverbial, causing also the purest spring-water in abundance.

The Board has passed stringent ordinances in communities where neglect of sanitary laws has required, which has been both educational and beneficial.

R. S. SNYDER,
Secretary.

MILLSTONE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Albert Thompson, Chairman, Clarksburg; Hon. Geo. J. Ely, Inspector and Secretary, Perrineville; George H. Hartman, Perrineville; Curtis Foreman, Smithburg; Wm. T. MacMillan, Perrineville.

Water-supply is all by wells and good; no source of contamination by sewage.

Drainage such as to procure dry cellars. No swamps and no malaria.

Houses constructed without basements but with cellars.

No tenement-houses used for more than one family.

No yearly inspection from house to house.

No sewers; all use water-closet system. Cesspools built with open bottom and sides.

No prevailing disease of man or animals.

Slaughter-houses in good condition.

No ordinances passed.

We have had about 13 cases of scarlatina, and 20 cases of pneumonia in our township the past year.

Six dead animals were ordered by the Board to be buried, and the order was promptly complied with.

The schools were made aware of the fact that any member unvaccinated and unable to pay, would be vaccinated at the expense of the Board.

GEORGE J. ELY,
Inspector and Secretary.

NEPTUNE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

S. W. Kirkbride, President, Asbury Park; L. E. Watson, Clerk, Asbury Park; Amos Tilton, Hamilton; Lewis Rainear, Hamilton. Dr. A. Williamson, Asbury Park, Health Inspector.

Neptune township is in better condition to-day than it has been for some time. The only bad feature is in West Park, where it is thickly settled. The Board of Health has had a great deal of trouble as to sewerage, and this season has had over 200 vaults put in. We hope before next season that West Park will have a good supply of water, as there is a company formed and a large force of men at work now. All sections outside are in good condition under the charge of Dr. Williamson, who has spent a good deal of time and done a great deal of good.

In relation to cholera, the Board of Health of Asbury Park and the township have had a joint meeting with Dr. Mitchell, and after talking the matter over agreed that a tent would be better than a building. They have some ready at a moment's warning, and a good location selected for the same.

We are having, or have had, a thorough house visiting, and a force of men cleaning up, at a cost of $200.

One of the bad features of Neptune township is the swill and garbage made in Ocean Grove and Asbury Park. Parties take the contract to remove it, and they need careful watching or they will make a nuisance before you are aware of it. The Board of Health has decided to pass an ordinance forbidding the dumping of anything of the kind unless having a permit from the Board.

L. E. Watson,
Clerk.

OCEAN GROVE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Rev. E. H. Stokes, President, Ocean Grove; Rev. A. E. Ballard, Ocean Grove; Hon. James L. Hays, Newark; Hon. Holmes W. Murphy, Freehold. J. H. Alday, M.D., Inspector, Ocean Grove.

The sanitation of Ocean Grove receives constant and most careful consideration. We are persistently enforcing the ordinance requiring proper sewer connections, with water-flushing. This necessitates connections with the artesian water system, and involves the use of pure water in the homes of the people. Since my last report, there have been made 33 sewer connections and 37 water connections; besides, 37 vaults with gratings were taken out, and pan and hopper connections, with water-flushing, substituted for them. Up to the present date, we have 998 sewer, with water-flushing, and 989 water connections. Notwithstanding the great crowds of visitors during the summer, we have had no epidemics and less sickness than in past seasons. The early spring inspection of all premises obtains in April and May. On account of the cholera excitement, the usual autumn renovation of the town was anticipated and carried out at a much earlier date than heretofore. At present, the general health of the community is excellent.

J. H. Alday, M.D.,
Inspector.

OCEAN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas R. Woolley, President, Long Branch; Levi G. Irwin, Seabright; James Dangler, Elberon; Howard A. Brinley, Assessor, Long Branch. George W. Brown, M D, Health Physician, Long Branch.

The same report as rendered by the Long Branch City Local Board of Health will apply to the Local Board of Health of the township of Ocean.

GEORGE W. BROWN, M.D.,
Health Physician.

RARITAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. Keough, John A. Hendrickson, A. F. Walling, John V. Arrowsmith. Post-office address of all, Keyport.

RED BANK.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

M. M. Drohan, Dr. Alfred F. Trofford, John Sheehan, James Walsh, John H. Cook. Post-office address of all, Red Bank.

The work done this year is largely similar to what has been done in previous years. All complaints are promptly investigated, and the nuisances abated. Localities where nuisances are liable to be found are visited at short intervals by the Inspector. In relation to an outbreak of cholera, the town and township Boards have held a joint meeting, and arrangements were made to promptly quarantine and isolate any case which may appear. The circulars relating to cholera, sent by the State Board, have been distributed.

JOHN H. COOK,
Secretary.

SHREWSBURY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Walter S. Whitmore, M D., Hon. William Tabor Parker, Charles B. Parsons, Borden Hance, Thomas P. Brown. William Henry Smith, Health Inspector. Post-office address of all, Red Bank.

Situated on Shrewsbury river. Population about 7,000. Water-supply from artesian well and wells throughout township. No sewerage nor drainage, except from houses on the banks of the river. Streets well laid out. No public grounds. No public market. No diseased animals. No slaughter-houses. Seven schools. One cemetery, four burying-grounds, regulated by State Board of Health laws. Diphtheria, scarlatina, small-pox have occurred. All complaints have been adjusted, and private quarantine when necessary.

There is a complaint of tide-water backing up on a tributary of the South Shrewsbury, known as Little Silver creek, causing decay of vegetable matter and jeopardizing the health of neighbors surrounding it. This Board wishes information as to how it may be opened, and what steps are necessary to be taken in the matter, as all persons owning property adjacent to the creek claim that they have no legal right to proceed in the matter, as it is the bed of the river.

A. C. Harrison,
Secretary.

UPPER FREEHOLD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

I. S. Daws, Imlaystown; E. A. Hyers, Red Valley; C. C. Wycoff, Allentown; William Quicksell, Hornorstown; F. C. Price, M.D, Imlaystown.

Wells furnish most water used. Drainage is according to the plans of each man's desire, except as advised when bad by the physician. Most farm-houses are good. Tenant-houses are often poor. Most all houses here have one or more cellars, used for milk and provisions. They are usually clean and well ventilated. Had one case of hydrophobia in a cow, occurring thirty-four days after being bitten by a mad dog. Two other cows were bitten at the same time that did not develop the disease. Several school-houses in the township, and all in good condition. About two hundred vaccinations were made last spring. La grippe, measles and catarrhal bronchitis and laryngitis have prevailed. A few inspections, with favorable results, were made.

WALL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James L. Allger, New Bedford; Henry Wainright, Brielle; F. P. Philbrick, Belmar; Dr. A. A. Higgins, Manasquan. John M. Allen, Health Inspector, Manasquan.

The health of the township has been fairly good during the year. We have had one case of small-pox, and that was confined to the one dwelling by strict quarantine. All nuisances have been abated at the first visit of the Inspector. The Township Physician and Inspector have been watchful, and have done much to keep the township clean; hence the good health of our people.

JOHN M. ALLEN,
Inspector.

MORRIS COUNTY.

BOONTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Horace Ford, Thomas Byard, Edmund H Stickle; Gilbert D. Crane, Clerk; Dr. Cuthbert Wigg; Joseph Steventon, Assessor. Post-office address of all, Boonton.

Water from wells, cisterns and streams; all pure. Drainage good, natural. Cellars dry. But little swampy ground and no malaria. Houses have cellars, partly used for storage of vegetables. Refuse is used for manure. Scarlet fever was prevalent in May and June. No diseases among animals. No slaughter-houses. One cemetery, but burials not reported as they should be. The Board has not passed any ordinances. There is so little of the township outside of the corporation of the town of Boonton that the Township Committee has not done anything as regards cases of cholera, but the county pest-house is so near it could be used in all cases of poor people.

JOSEPH STEVENTON.

CHATHAM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dayton Baldwin, New Providence; Eugene Hopping, Afton; Geo. S McDougall, Chatham; Edward P. Miller, Chatham. Wm. J. Wolfe, M.D., Chatham, Health Inspector.

The Chatham Township Board of Health, consisting of the same members as in 1891, organized early in January, and held regular monthly meetings during the winter.

In the autumn of 1891, there were a number of cases of diphtheria at Chatham, most of them of a very mild form. Five or six cases proved fatal. The Health Board made a house-to-house canvass early in November, and closed the public schools for three weeks, and compelled all the residents to cleanse and disinfect their premises. The school-house was thoroughly disinfected. The contagion, no doubt, arose from the foul condition of the Passaic river, the waters of which are badly contaminated by sewage from the town of Summit.

An isolated case of diphtheria occurred in a family near Green Village, in which three children died.

The Inspector has regularly visited all the schools in the township.

No code of ordinances was passed by the Board, though this was strongly recommended by the Inspector, and no meetings were held by the Board during the summer.

W. J. WOLFE, M.D.,
Inspector.

CHESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. A. Green, M D., President; W. E. Youngs, Spafford L. Leek, Elias M. Patrey; Henry P. Drake, Secretary. Post-office address of all, Chester.

Board of Health organized May 14th, 1892. No complaint has been brought to its attention. Population about 1,800. Township very hilly. Water-supply obtained from wells and cisterns. No sewerage system, cesspools and open drains being used. No tenement-houses. Petroleum used for lighting. Refuse and excreta used for fertilizing purposes. One small slaughter-house, neatly kept. Two burying-grounds in the township, which are well cared for. Seven school-houses in township; six of wood, one stone; one or two of their outhouses are not kept as good as they should be. No diseases of animals. The public health has been good. The Board has been to no sanitary expense. No prevalent diseases during the year; a few isolated cases of diphtheria, measles, scarlet fever and two cases of typhoid fever, one of the cases being brought here by a person who had nursed a friend in another State.

H. P. DRAKE,
Secretary.

DOVER.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Able, Joseph H. Hulsart, A. J. Pitman, Joseph V. Baker. James Hogan, Health Inspector. Post-office address of all, Dover.

There is no organized effort of the Board to obtain information upon any of the subjects required in this report. They never hold meetings except for the purpose of hearing complaints in regard to nuisances. Within the past year a Health Inspector was appointed, who does what he can to abate such nuisances as come under his observation. It is therefore quite impossible to make a detailed report for lack of information.

JOSEPH V. BAKER,
City Clerk.

HANOVER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Walter H. Mitchell, Whippany; George W. Bates, Morris Plains; George Cook, Hanover; E. P. Cooper, Troy Hills; Joseph H. Bastedo, Assessor, Boonton.

There is nothing new to report. It has been healthy throughout the township the past year. No horse or cattle diseases prevailing to any extent. Seldom a complaint made in regard to a nuisance.

JOSEPH H. BASTEDO.

JEFFERSON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob J. Tallman, Milton; Charles Jennings, Milton; Newton Weaver, Milton. A. J. Fretz, Township Clerk, Milton. S. Utter, Assessor, Woodport.

This township, situated in the hills of Morris, has excellent natural drainage. Water, from springs and wells, is of the best. A few complaints have been made to our Board of places which were considered as nuisances or dangerous to the public health, all of which have been, with one exception, which is now pending, abated. During last winter we had an epidemic of measles of a mild form; also a few cases of scarlet fever, which were quarantined, houses fumigated, &c., and the disease thus kept from becoming epidemic. There have been no extra steps taken to combat a cholera epidemic.

S. UTTER,
Assessor.

MADISON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. Anderson, M.D., President, Madison; Henry M. Sacks, Secretary, 133 Greene street, New York City; I. N. Van De Water, Treasurer, Madison; William T. Brown, Madison; Samuel Brant, Madison. E. P. Felch, Health Inspector, Madison.

Water-supply from works owned by the borough, and not subject to any contamination.

No sewerage system; cesspools and privies emptied on farming lands.

Borough also owns electric light plant, and is introducing same into private houses.

Board has been active in abating nuisances complained of, and with good results.

E. P. FELCH,
Inspector.

MENDHAM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

M. Robinson, Mendham; F. H. Garabrant, Brookside; Peter F. Hill, Mendham. Dr. John S. Stiger, Health Inspector, Mendham.

The healthfulness of this township has been and is about the same as it was when we made our last report, *i. e.* remarkably good.

During the past year we have had no contagious diseases, and but few deaths, and they were generally from old age.

The village of Mendham is a small hamlet situated on an elevated highland, something more than 600 feet above the level of the sea. Its population consists of about 200 souls, enjoying as a rule, exceptionally good health. The gradual sloping of the land in all directions forms a most complete system of natural drainage.

There are no slaughter-houses within the limits of the town; no stagnant pools of water, and no accumulations of decaying garbage.

To the above conditions, in large measure, is to be attributed the healthfulness of the place.

M. ROBINSON,
Chairman.

MORRISTOWN.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. F. Halliday, President; Henry P. Witte, Robert C. Walsh, James S. Adams; Stephen Breese, Secretary. W. Mulford, Health Inspector. Post-office address of all, Morristown.

Aqueduct water, collected from springs, is quite abundant and free from all contamination. Refuse and excreta are buried or otherwise disposed of beyond the city limits; cesspools cleaned by the public excavator and taken out of town. No diseases of a contagious nature among animals. One hospital, open for all medical and surgical cases except contagious diseases. Evergreen Cemetery just inside of the city limits, but isolated; soil sandy. Two graveyards in center of town, connected with churches; very seldom used. All quarantine attended to by Board of Health; no public quarantine building. During the winter we had a great many cases of measles, with no deaths. Three cases of diphtheria have occurred. The town has been remarkably healthy all summer and fall, and at the present time the sanitary condition is good. The city has been thoroughly cleaned and all the garbage removed. During the summer the Health Inspector made an examination of all the yards in the rear of all the stores and houses in town, and all nuisances, if any, were abated.

MORRIS TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Nicholas Arrowsmith, D. Farrand Sturgis, George C. Smith, Thomas F. Clifford, Charles A. Halsted, M.D. Post-office address of all, Morristown.

Morristown is supplied with water by the Morris Aqueduct Company, a private corporation, and the water is taken from springs and mountain streams in the outskirts of the town and pumped into reservoirs situated at a height sufficient to furnish a sufficient pressure to force the water through the town and into the houses. There has been no taste to the water, neither has it been discolored during the past year. The aqueduct company are careful to keep the water unpolluted from surface-water or any deleterious substance. A portion of the township is not supplied by this aqueduct company, but is dependent upon wells, springs and cisterns for its supply. It is impossible to state the number of houses that are supplied in this latter manner. Almost all within reach of the aqueduct mains have, or are having, that water put into their houses. As to drainage, there is no system of public sewers, and, as the soil is in most parts of the township gravelly, the cellars are usually dry. There are no swamps in the township and malaria is very infrequent. The houses generally have a basement or cellar. In the town of Morristown a few cellars are occupied, but in most cases they are used simply for storage. There are no tenement-houses where several families reside outside of the town of Morristown, but in the town there are a number of houses where several families reside. Inspection of all the houses, sewers, &c., in the town comes under the City Board of Health, there being a Board of Health for the city independent of the Township Board. The refuse and excreta are gathered by a private individual. Cesspool matter is pumped into air-tight tanks by an odorless arrangement. The solid matter is worked up into fertilizer, and the liquid matter is emptied into a piece of sandy ground, where it is immediately absorbed. Disinfectant is in all cases put into the cesspools or privies before they are opened or the contents removed. The cesspools as a usual thing are not cemented, but are built with open bottoms, and most all of them with brick sides. There has been no prevalent disease this year among cattle. No hogs are allowed to be kept within the city limits. There are but few slaughter-houses in the township, and they have been inspected by the Inspector, and are conducted so as not to be a nuisance. A fat-rendering establishment, formerly located on Western avenue, became a nuisance owing to the town building up in that immediate vicinity, but upon application of the health authorities it was removed to a different quarter of the township, but complaint was again made by the neighbors, and, after the Board of Health and Health Inspector had investigated the matter, several remedies were suggested, which were acted upon by the owner, and the place is now conducted so as not to be a nuisance. There have been no new school-buildings nor other buildings of that character erected during the past year. A hospital has been built in the township, and was opened about September 1st. The building is very convenient, and has a fine corps of physicians. The institution is called "All Souls' Hospital," and was built by subscriptions, and is intended to receive persons from the counties of Morris, Sussex and Warren. The cemeteries inside the city limits are practically unused, no one being allowed to bury except owners of plots. Most of the burials are made in the Evergreen Cemetery, which is located on the outskirts of Morristown, or in the Catholic Cemetery, which is also located in another part of the township, on the Whippany river. The public health has been practically good during the past year. There were a number of cases of measles in the city and in the township during the last winter, but they were very light. There were also a few cases of scarlet fever. The physicians send in their returns to the proper officials promptly. There is no quarantine provided for in the township or places where contagious diseases could be removed to. Sanitary expenses are raised by tax upon the people of the township. The dwellings are heated by steam, hot-air furnaces and stoves, and a few are heated by hot water. The public buildings have the usual and approved means of ventilation, as have some of the newer buildings, but the old buildings are ventilated by letting down the windows in the usual style. The Board of this township has done very little during the last year except to inspect the township thoroughly from time to time, as that part of the township outside of the city limits over which they have control is in a very good sanitary condition and very little needs to be done. The Board of Health has taken no steps toward preparing for cholera. The City Board of Health has made some arrangements, but just what, this Board is unable to say.

THOMAS F. CLIFFORD,
Health Inspector.

MONTVILLE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Copstick, Montville; John Husk, Glen View; Walter A. Young, Boonton; J. W. Van Duyn, Pine Brook.

MOUNT OLIVE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. J. Clift, Chairman, Netcong; M. T. Thomas, Draketown; B. A. Howell, Flanders; C. N. Miller, M.D, Flanders; A. H. Bartley, Secretary, Bartley. C. N. Miller, M D., Flanders, Health Inspector.

I presume there are a few cesspools in the township, but very few, and I am unable to say whether those used are cemented or not.

No prevalent disease during the last year. Assessor does not inquire each year as to losses of animals and as to contagious diseases, but any increase over the normal condition of affairs would be promptly found out, as our township is small.

Slaughter-houses kept without complaint.

Our Board passed ordinances last year, and on September 7th, 1892, they appointed Dr. C. N. Miller Inspector, with power to act in case of cholera or any infectious disease making its appearance. All physicians in township were notified that all such cases or suspected cases must, under section 12, be referred to Inspector.

Our Board has been called to abate but one nuisance during the year; this at Netcong, and was caused by a drain-pipe decaying and stopping drainage. Some difficulty was experienced in deciding who was responsible for the maintenance of the nuisance. It was, therefore, decided that the Township Committee should abate the same at the expense of the township, which was promptly done.

In view of a possible invasion by cholera, it was decided, at a meeting held September 7th, to have an Inspector, to whom all cases or suspected cases of cholera or infectious diseases could be reported; said Inspector to take them in charge, isolate, or in any way deal with them as the safety of the people may demand.

A. H. BARTLEY,
Secretary.

PASSAIC TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

F. L. Hendrickson, Madison; Andrew S. Bird, Long Hill; Jacob Ogden, New Vernon; John Veader, Green Village.

The health of the township has been good for the past year. There have been no contagious diseases, and the people are particularly healthy. The Health Board has not been organized, as it was considered unnecessary.

F. L. HENDRICKSON,
Assessor.

PEQUANNOCK TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. Z Ryerson, Lincoln Park; S. Benjamin, Lincoln Park; B. C. Demarest, Pompton Plains; John Haycock, Butler; John Rogers, Butler.

Pequannock township is very healthful, and we have not had any occasion to organize.

J. ROGERS.

RANDOLPH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

L B Headden, Dover; F. M. Headden, Dover; Isaac Hance, Dover; John Downey, Port Oram.

Have not regularly organized as a Board of Health.

ROCKAWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jas. B. Tonking, Chairman, Mount Hope; E. Fox, Rockaway; M. Hoagland, Jr., Rockaway. C. L. Beach, Assessor.

Supply of water is from springs, wells and cisterns, the cistern-water (with few exceptions) used for household purposes other than drinking and cooking.

No system of drainage or sewerage other than the natural drainage of the country. A few cesspools are in use by private parties for their own needs.

Houses are built of wood, with few exceptions, and are occupied by only one family in most cases. Around the mines, houses are built to accommodate two or more families; nearly all have cellars, which are used for the storage of general supplies for the household. Houses with basements to be used for living apartments are so few that report is unnecessary.

No sewers, and no cesspools worthy of mention.

No diseases of animals known to exist.

The slaughter-houses, some four or five in number, are kept in good condition. The greater part of the meat sold is Western dressed beef.

In addition to former report, would state that there have been two large factories built within the past few years, both fine brick buildings, used at present one for the manufacture of bicycles and the other for knit-goods.

No ordinances passed, as none were called for, owing to the fact that the general health of the township is excellent. No prevalent diseases to report.

No preparations made for cholera epidemic, as none were deemed necessary or called for.

C. L. Beach,
Assessor.

ROXBURY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John L. Taylor, M.D., Succasunna; Theo. King, Ledgewood; Judson Cook, Ledgewood; Thos. Allen, Port Morris.

Water-supply from wells and springs; no other supply. No system of drainage. In most parts the cellars are dry, but not in all. Cellars generally used for storing vegetables. No house inspection. Cesspools with open sides and bottom; contents generally mixed with lime and ashes and used on farms and gardens. No particular diseases during the year.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Philip Schuyler, Naughright; Elijah Dufford, Middle Valley; Stewart Neighbour, German Valley; Henry Wiley, Drakestown; Elmer E. Hoffman, Middle Valley. Edward Sutton, M.D., German Valley, Health Inspector.

Water-supply mainly from wells; drainage good; no sewerage; slaughter-houses in good condition; school-houses in good condition; cemeteries and burial-grounds in good condition; public health good; no prevalent diseases but la grippe last winter; the Board advocated general vaccination, which was not done.

OCEAN COUNTY.

BERKELEY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. J. Harney, Geo. Evernham, C. Lawrence, Henry Williams. Devine Butler, Health Inspector. Post-office address of all, Bayville.

Water-supply natural.

Few cellars. One tenement-house more than one family. House-to-house inspection, none. No sewers.

Very few deaths from disease of animals.

Every attention will be given to anything appertaining to health and the general welfare of our township, which is very small and healthy.

C. LAWRENCE,
Chairman.

BAY HEAD.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. M. Chadwick, Jos. Stout, E. Loveland, Frank Ferry, A. E. Johnson. Post-office address of all, Bay Head.

No organized Board; the above-named are the Councilmen. The sanitary condition of the borough is good.

J. R. HALL,
Assessor.

DOVER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Adolph Ernst, Chairman, Toms River; James I. McKelvey, Toms River; John Tilton, Silverton; A. W. Irons, Clerk, Toms River.

Water-supply from wells and springs.

No swamps near. No malaria. Cellars are generally dry.

No sewers.

No prevalent diseases this year. No loss of animals.

Slaughter-houses are in good order, and inspected regularly by the Board.

No ordinances. Returns are regularly made.

The Board meets regularly on the first Saturday in each month. They have visited the jail, school-houses, slaughter-houses, &c., regularly through the summer, and have found no diseases of any kind. Generally very healthy.

A. W. IRONS,
Assessor.

EAGLESWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

P. R. Sprague, West Creek; C. H. Seaman, West Creek; E. F. Cranmer, West Creek; S. P. Cranmer, West Creek; Dr. W. M. Reeves, Tuckerton.

I am happy to state in this report that our township was never in a more healthy condition. No contagious diseases.

S. P. CRANMER,
Assessor.

JACKSON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Johnson Bills, Vanhiseville; Joseph T. Clayton, Jackson's Mill; Harry Appleget, Bennett's Mill; C. M. Thorne, Assessor, Vanhiseville; Irwin W. Kirk, M.D., Manchester. Wright M. De Bow, Clarksburg, Health Inspector.

No report to make.

LACEY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. F. Holmes, Assessor, Forked River; T. C. Van Arsdale, Cedar Creek; A. G. Wilbert, Forked River; B. F. Mathews, Forked River. Dr. O. A. Wood, Health Inspector.

Our Local Board of Health is permanently organized and ready for action at any moment. The general health of the township has been very good the past year. The knowledge that an efficient Board of Health exists produces good results, and the people are ready at any time to take advantage of it to remove any nuisance that may exist.

B. F. MATHEWS.

LAKEWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Lane, C. H. Dix, John B. Peters, H. H. Cate, M.D., R. B. Robbins. Luke Johnson, Health Inspector. Post-office address of all, Lakewood.

Located in the upper portion of the pine-belt, about ten miles from the sea. Soil dry and sandy, favorable to persons with weak lungs and throat trouble. Population about 1,400.

Sandy; some gravel, no clay. Rolling country; no hills of any extent.

Water is pumped from the lake through filters to stand-pipe.

The village is fully sewered; no cesspools in the village now, that I am aware of.

Streets are all clean and in good order, the Health Committee having gone over them about the middle of September.

But few tenement-houses; only one with more than two families in it.

A few outside closets with vaults sealed. Refuse, ashes, &c., are removed by private contract.

One case of glanders, promptly killed. No slaughter-houses; no factories.

A few outlying school-houses of wood. One large one just completed in the village, with the best of ventilation and heating. All of the excreta is burned by the Smead system.

Health of the community has been generally good. No epidemics. One scarlet fever, a few of measles, one of diphtheria, and one of typhoid fever. The Board has adopted ordinances, and will see that they are enforced.

There have been no prevalent diseases, take the year as a whole, but follicular tonsilitis has been more frequently met with than usual.

The Board meets once a month to transact any business that may come before it. It has attended to all complaints, and had the trouble removed in all cases. The Board also sees that the street gutters and cross-gutters are kept open and clean. The Board takes a lively interest in keeping the sanitary condition of the town good.

LITTLE EGG HARBOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. L. Cowperthwaite, President; C. M. Berry, James Rose; Alex. Cowperthwaite, Assessor; Theophilus T. Price, M D., Secretary of Board. Post-office address of all, Tuckerton.

Answers to all your questions have been given in former reports.

In view of the anticipated invasion of cholera, the Board of Health issued early in September, a circular, and had one carried to every house in the township.

Our township has been unusually healthy since last spring. No epidemic has prevailed. The grippe was severe and prevalent last winter, and was fatal to several of our older citizens.

THEOS. T. PRICE,
Secretary.

MANCHESTER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. I. W. Kirk, C. A. Wilbur, Wm. Montgomery. T. Dowd, Jr., Assessor and Health Inspector. Post-office address of all, Manchester.

Elevated location. The population 750. The climate mild.

The water-supply by streams and wells.

The drainage is natural.

The streets in good condition.

The houses are occupied by from one to two families.

The school-house in good condition.

The two burial-grounds are kept in good condition.

The statistics are all reported by the Assessor.

The prevailing diseases in the township for the year have been typhoid fever, measles, mumps and diarrhœa.

Have no Board organized.

OCEAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wykoff Letts, Z. H. Wilkins, Charles Bowker, William Gray. Post-office address of all, Waretown.

PLUMSTEAD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Winfield S. Chaffey, New Egypt; Ivins J. Davis, New Egypt; William Q. Parker, Hornerstown; Aaron S. Bronson, Clerk and Assessor, New Egypt. Howard Allen, M D., Health Inspector, New Egypt.

There have been no contagious diseases in Plumstead township.

The village water-supply is from wells; mostly soft and of good taste.

Generally, throughout the township and village the cellars are dry. There are no swamps near the village and no malaria.

Slaughter-houses are inspected so as not to be a nuisance.

Our Board has met and adopted a Code of Laws for the year 1892. The Board has no trouble in sanitary matters.

AARON S. BRONSON,
Clerk.

POINT PLEASANT BEACH BOROUGH.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Frank Whittaker, President; Abraham Lower, Clerk; J. M. Van Note, William H. Irons, Charles C. Johnson. Thomas Dickson, Health Inspector. Post-office address of all, Point Pleasant.

Located on the sea-coast; population, 500; climate, salubrious. Water-supply partly from open wells, driven wells and pipe-line service from private water works; soft and good. Surface drainage; no sewer system; no malaria; cellars dry. Streets and public grounds in good cleanly condition. Houses principally occupied by the owners, excepting those rented by summer visitors; no basements. Refuse removed by private scavengers beyond the borough limits, regulated by ordinance of the borough; cesspools cemented sides and bottom. One large new school building, in good condition; four churches. Code adopted by Board and generally observed. Returns regularly made to the Clerk of the Board. Vaccination general. Have had no contagious diseases. Buildings heated principally by stoves; coal fire. Our Board has had very little to do. There are but few cases calling for the attention of the Health Board. We caused two overflowing cesspools to be cleaned, had offensive oyster-shells removed, served two notices and abated offensive surface drains. The Board is well organized and efficient, ready and determined to suppress all nuisances and keep the place clean and healthy, even if it is necessary to resort to the extreme extent of the law.

ABRAHAM LOWER,
Clerk

STAFFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. H. Cranmer, Manahawkin; John Letts, Manahawkin; S. P. Irwin, M D., Manahawkin; J. B. Courtney, Manahawkin; Lewis A. Cranmer, Mayeta.

UNION TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph A. Pharo, George H. Van Note, Andrew F. Kilpatrick, Emmor R. Wills. Dr. Edmund Bennett, Health Inspector. Post-office address of all, Barnegat.

PASSAIC COUNTY.

ACQUACKANONK TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Nicholas Frederick, President, Lyndhurst; Charles F. Hemmenway, Secretary, Clifton; Daniel H. Schoonmaker, Richfield; John H. Merselis, Clifton.

Bounded north by Paterson city, east by Bergen county, south by Passaic city and Essex county, west by Little Falls township and Essex county.

Population, census of 1890, 2,562.

Largely farm-houses, occupied by owners.

Six school-houses. No other public buildings.

Code filed with State Board.

Very little sickness; none prevalent; mostly the ordinary complaints arising from colds and exposure.

Nothing done except during the cholera excitement, when they quarantined two families who had been to visit a family in New York, some of whom died of cholera; and to cause manure piles to be removed from the highways and canal bank; and to cause a speedy removal and burial of dead animals and decaying matter.

LITTLE FALLS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Hawthorne, Little Falls; Charles Wane, Little Falls; Richard Casson, Paterson; Walter Bott, Assessor, Little Falls. E. A. Keeler, M.D., Health Inspector, Little Falls.

MANCHESTER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Richard E Doremus, Chairman, Paterson; John Rheinhardt, Paterson; Adam Vreeland, Hawthorn; S. Cyrus Townsend, M D, Paterson; Wm. D. Berdan, Secretary, Paterson.

Water-supply is from wells, springs, cisterns and brooks. A large majority of the people get their water-supply from wells.

No system of drainage other than natural surface drainage. Cellars are dry, as a rule; the water level is such as to secure dry cellars. No swamps to any extent in the township. No malaria the past year.

Houses, generally, have cellars; a very few have basements. Occupied cellars are used for storage of vegetables. There are some five or six houses with more than two families. There is no yearly house-to-house inspection.

No sewers in Manchester township; cesspools are in all imaginable forms. Some are built with brick and cement, and have covers, and are emptied with pumps; some have open bottoms; some are depressions in the ground, where slops and refuse collect, and occasionally they are cleaned, and the accumulations are used on the land as fertilizers.

As far as I can learn there has not been any disease among animals the past year.

There are two slaughter-houses in the township on a small scale. One of them was complained of last July. The Board made an inspection and found the complaint groundless, as everything connected with the business was in good order. The other one I visited last week (being October 13th), and everything connected therewith was clean and orderly.

There are six school-houses in the township; five of them are new, built within the past five years, with modern improvements, ample grounds, &c. Last March the Trustees of School District No. 9 had to close the school on account of diphtheria and scarlet fever. In the meantime the Trustees had the school-room fumigated and the interior cleaned and painted.

There are three cemeteries in the township. Burials are conducted according to law.

We have passed ordinances, and when any of them are broken, we bring the guilty party to justice.

Last spring, in the months of March and April, German measles and scarlet fever were quite prevalent throughout the township. There were three deaths from scarlet fever and one from diphtheria reported.

The Board ordered a stagnant pool of water which emitted sickness in ths neighborhood, filled up with sand or earth, which order has been complied with.

WILLIAM D. BERDAN,
Secretary.

CITY OF PASSAIC.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Bowker, B. G. Volger, Dr. W. H. Carroll, Dr. Jno. Sullivan, Chas. E. Denholm; Jno. McCarthy, Sanitary Inspector; W. A. Willard. Dr. G. J. Van Schott, Health Inspector. Post-office address of all, Passaic.

Passaic City is situated in the northeastern part of the State of New Jersey. The population at present time is about 16,000. The climate is temperate.

The source of Passaic's water-supply is from Passaic river, above Passaic falls, Paterson. It was introduced 1890. It is controlled by a company in Paterson. During the year just ending the Local Board of Health has enforced its use in most all houses, especially those in the lower districts of the city, where well or cistern-water is likely to become contaminated with disease-breeding germs, and also every new building must have city water put in before they use the house. The water is soft and is also clear. The pipes are frequently cleaned. There is no sewage above the intake of the water. The exact number that depend on wells and cisterns I could not say. There are quite a number depend on both in the better part of the city. The Board of Health has a number of houses on list that do not use city water, but, as reported above, are enforcing the use of it.

There is a separate sewer for surface-water in some parts of city, and in others the one sewer is used for both sewage and surface drainage.

The cellars of buildings are dry.

The system of sewers is the Waring, consisting of eight-inch tile-pipe with automatic flush-tanks, which flush every twenty-four hours. They have been in use for two years.

Very few houses have basements but all have cellars, the former being used for living purposes.

There is a yearly inspection of tenements.

The sewers extend over most all parts of the city. The Board of Health compels all buildings erected, and especially those in course of erection, to connect with sewers.

The only prevalent disease was small-pox, in the months of May and June.

Our streets are in first-class condition, and we have also added a public park this year.

JOHN K. BOWKER.

PATERSON CITY.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theo. Y. Kinne, President; James Mills, Frank E. Agnew, M.D., B. C. Magennis, M.D, Philander A. Harris, M.D., John T. Pollitt. John L. Leal, M.D., Health Officer. Post-office address of all, Paterson.

NUISANCES, COMPLAINTS AND INSPECTIONS.

Complaints of nuisances and violations of health laws made to this Board	1,987

Note.—All of these complaints have been investigated and proper steps taken to abate nuisances and secure obedience to health laws.

Complaints well founded and nuisances found to exist	1,821
Nuisances abated and grounds of complaint removed	1,807

Note.—Of those not abated, some are laid over for more favorable weather, and the remainder it has been found impossible to abate on account of legal difficulties.

Inspections of premises made	3,053
Number of notices served	1,855
Scavenger permits issued	926
Cases tried in Recorder's Court	6
Cases decided in favor of the Board of Health	6

COLLECTION AND DISPOSAL OF GARBAGE.

Complaints received	219
Complaints well founded	202
Garbage disposed of at Sanitary Works (tons)	2,915

Licenses Granted.

During the year licenses were granted as follows:

Licenses to keep cows	5
Licenses to sell ice	5
Licenses to clean privy-vaults, cesspools, &c	2

Licenses previously granted which are still in effect:

Licenses to keep domestic animals	798
Licenses to maintain slaughter-houses	2
Licenses to maintain glue factories	2
License to maintain feather-cleaning works	1
License to maintain smoke-house	1
License to maintain Paterson Sanitary Works	1
License to cut ice within city limits	1
Licenses to sell ice	7
Licenses to manufacture and sell artificial ice	4

Work accomplished during year with relation to the construction, plumbing and drainage of buildings:

Total number of permits granted	1,155
(*a*) For new buildings	289
(*b*) For extensions	866
Inspections	2,956
(*a*) Final inspections	761
Number of complaints of old plumbing systems investigated	72
Number of old plumbing systems condemned	62
Total number of sewer connections made	493
(*a*) For old buildings	328
(*b*) For new buildings	165
Total number of feet of earthen and cement pipe used	40,507
Total number of feet of cast-iron soil and waste-pipe used	51,450
Total number of plumbers registered	63

Work accomplished during year as regards markets and foods. During the year there was condemned, seized and destroyed, the following amount of food stuffs:

MEATS.

"Bob" veal	165 lbs.	Mutton	40 lbs.
Veal	90 "	Pork	80 "
Beef	985 "	Sausage	65 "
Corned beef	130 "	Tripe	40 "
Beef liver	49 "		

FOWLS.

Chickens	78 pairs.	Turkeys	15 pairs.
Ducks	30 "		

GAME.

Rabbits	5 pairs.

FISH.

Fish	1,220 lbs.

VEGETABLES.

Vegetables	30 barrels.

FRUITS.

Fruits	46 crates, 30 barrels.

Contagious Diseases.

The past year has been a noteworthy one in the sanitary history of our city, the number of deaths far outnumbering those in any previous year. Diphtheria has been unusually prevalent and of a very fatal character, the death-rate from that disease being about thirty per cent.

The epidemic of influenza in December, January and February was a severe one, and the evidence of its ravages may be seen by a glance at the mortality table. The increase in the number of deaths from bronchitis, pneumonia, heart disease, and among those declared to have occurred in consequence of old age—many of which can be attributed directly to influenza—shows that the disease, which seems to have become a yearly visitor with us, deserves the most careful investigation of sanitarians.

Sewerage System.

The sewerage system of the city has been greatly extended during the year, three and seven-tenths miles of sewers having been completed, and many new sewers having been started. The most important of these is the great "East-side" main sewer, which will provide for the drainage of a large and growing section of the city, and which will also relieve the greatly overworked "Sandy Hill" system.

A serious problem in connection with our sewer system soon to confront us—and which was brought particularly to our attention during the prolonged dry spell of last summer—is the fact that for several years past—particularly in the summer time—there has not been enough water in the Passaic river passing through the city to properly take up and carry off the yearly increasing amount of sewage being poured into it. Growing as rapidly as this city is, and as it is likely to grow in the future, this problem must be met and solved soon. There is no need of impressing the importance upon those who noticed the condition of the river last summer, which was a serious menace to the health of the city. This condition, too, will grow worse from year to year, due to the fact that large amounts of water will now be daily drawn from the head-waters of the Passaic for the use of the city of Newark, and probably in a short time for the use of other cities, and also due to the fact that more and more sewage is being poured into the river each year. Agitation upon this subject should be begun and kept up unceasingly until the matter be remedied.

Collection and Disposal of Garbage.

The operation of our garbage system during the year has been somewhat upset by the burning down of the garbage works, and their consequent stoppage for about four months. During that time the garbage was carted outside of the city limits, and the greater part of it dumped upon farm lands and used as fertilizer. The long hauls made necessary by this method of disposing of it rather crippled the collection system, and many complaints were the result. The works have now resumed operations, however, and the system is running more smoothly. No complaint of nuisance arising from the new sanitary works has been received as yet, and it is to be hoped that the opposition of the residents of the neighborhood to the operation of the old works may have died out, and that no occasion for its rekindling may be given. The two most important reforms needed in the system are in the character of vehicles used, and in the hours of its collection. All ash and garbage carts should be covered, and the latter should be of iron, and so constructed as to dump their contents. Some arrangements should by all means be entered into to have the collection made either at night or in the early hours of the morning, so as to do away with the nuisance of ash and garbage cans standing upon the sidewalks all day, and their contents blowing upon the streets and upon passers-by. It is but just, however, in all criticism passed upon the new system, to keep in mind one very important point. During the last year 2,915 tons of garbage were collected and disposed of in a sanitary manner. Under the old system this great mass of reeking and putrefying animal and vegetable matter would have been spread over the surface of vacant lots throughout the city, to the great injury not only of our own health, but also to the health of those who will come after us. This assuredly is a great gain, and more than counterbalances any defect of detail and management in the present system.

Water-Supply.

Probably the most important work taken up by this Board during the past year has been a thorough investigation into the condition of the water of the various surface and so-called artesian wells scattered so numerously throughout the city, and the waters of which have been so universally used. Analysis of individual wells had been made by different chemists in former years, and the results had been uniformly bad. Different wells had been ordered closed by this Board, which, though closed at the time, we find had afterwards been re-opened and used.

JOHN L. LEAL, M.D.,
Health Officer.

POMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. J. C. Morgan, Pompton Lakes; Lemuel Van Ness, Assessor, Pompton; Silas Mead, Chairman, Bloomingdale; Daniel A. Wheeler, Treasurer, Erskine; H. J. Smith, Pompton Lakes.

Wells and springs furnish water-supply of the best quality. A house-to-house inspection by the Assessor. No prevalent diseases.

The Board has met with the committee several times during the year, but there has been nothing of importance to require further work.

SILAS MEAD,
Chairman.

WAYNE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George R. Berdan, Mountain View; Garret Berdan, Jr., Paterson; David F. Duncan, Paterson; John G. Merselis, Paterson.

Water for family use is obtained from wells and springs. Water abundant and extra good. The drainage is chiefly natural, the township being hilly and having considerable general elevation. There is no sewerage system. Cellars are dry. Lands drained sometimes with open ditches and tile underdrain. Very little malaria. Most houses are of wood, some of the older ones of stone. Not generally very close together. Occupied in most cases by farmers. Cellars are quite commonly used for storage of vegetables. Do not think there are any tenement-houses of more than two families. There is no house-to-house inspection other than that the Assessor makes in his rounds. No sewers. Cesspools mostly open at bottom and sides. Excreta mixed with earth or ashes and spread upon land. No markets. No prevalent diseases of animals. There are three places in township where animals are occasionally slaughtered. They are not close to dwellings, and refuse is properly taken care of. Meat is usually bought ready dressed in Paterson markets. Five school-buildings and two churches. Burying-ground adjacent to Reform Church of Preakness. Grounds kept in good order. A few old homesteads have private burying-grounds, but these are very seldom used. No prevalent diseases. The Board met and organized. There has been nothing especially requiring their attention since, and no further meetings held. There is no Inspector or medical officer, and there does not appear to be any need of one.

WEST MILFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Henion, Echo Lake; Sylvanus N. Gregory, West Milford; Oscar F. Smith, West Milford.

Answers to questions same as in previous years.

No provisions of any kind have been made in case of cholera.

J. H. SCHULSTER,
Assessor.

SALEM COUNTY.

ALLOWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Daniel D. Hitchner, Cohansey; Wm. Sickler, Yorktown; Joseph Kerlin, Alloway; J. F. Ayres, Assessor, Alloway.

LOWER ALLOWAYS CREEK TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Beaston, Harmersville; Wadington B. Ridgeway, Hancock's Bridge; William D. Baker, Canton; Dr. F. B. Harris, Canton; Mark T. Hilliard, Assessor, Hancock's Bridge.

We have no contagious diseases in our township this year. We have but one slaughter-house in the township and that is along the creek and the tide takes the waste away. There has been nothing to do. We have no Health Inspector. I generally inquire about diseases among stock.

MARK T. HILLIARD,
Assessor.

LOWER PENNS NECK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Lindsey, Salem; Charles W. Powers, Pennsville; Richard D. Batten, Pennsville; William H. James, M.D., Pennsville; Eph. Fowler, Pennsville.

MANNINGTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. Smith Bassett, David S. Fogg, Barclay Griscom, William H. Acton. Post-office address of all, Salem.

The health of our township has been unusually good during the season. No sickness among the inhabitants of the township more than usual, and none among animals excepting an occasional case of hog cholera. Our Board has been called upon but once to abate a nuisance during the year.

WILLIAM H. ACTON,
Assessor.

OLDMANS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. F. Hunt, Pedricktown; Frank Gaventa, Pedricktown; Josiah Crispin, Pedricktown; Jacob J. Hunt, Auburn. H. T. Johnson, M.D., Pedricktown, Health Inspector.

This locality being mostly agricultural there does not seem to be much for the Board of Health to do. We have two villages in the township, and there are no factories or slaughter-houses in them. The slaughter-houses are about a mile out in the country. The health is generally good.

Wm. F. Hunt,
Assessor.

PILESGROVE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John G. Borten, Chairman, Woodstown; Charles Richman, Sharpstown; George B. Grier, Woodstown; C. H. Richman, Secretary, Woodstown; Dr. P G. Sowder, Physician, Woodstown.

Water-supply, surface wells. Borough of Woodstown, in said township, is constructing a system of water works for water-supply in said borough. Water derived from artesian wells, six in number, and about 150 feet deep. Water is clear in color. Contains traces of lime, also of iron. Is free from nitrates and nitrites. Has been analyzed by E. G. Green School of Science, and reported as fit for all domestic purposes. The committee in charge of construction have a number of applications for water as soon as the works are completed.

No drainage or sewerage, except natural drainage.

Houses mostly single dwellings.

Refuse and excreta collected and used for fertilizers.

No prevalent disease among animals the past year.

Schools in a flourishing condition and school buildings well cared for.

Have had no prevalent disease during the year.

Have no provision in case of cholera.

No complaints to the Board during past year, except against storing fertilizers in borough of Woodstown. Matter referred to Borough Council, as they have an ordinance governing such matters.

C. H. Richman,
Assessor.

PITTSGROVE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. M. Heitchner, Elmer; W. W. Golder, Centreton; J. M. Clark, Norma; J. W. Golder, Assessor, Centreton; A. B. Woodruff, Physician, Elmer.

There have been three meetings of the Board during the past year. Have established a code of ordinances about as suggested in the circular from your bureau, and have published the same for the benefit of the people of our township.

The last meeting was held September 16th, at which time an examination was made of the small stream running through a part of Elmer, and which catches the refuse from the canning-house at that place. Gave instructions to have the stream cleaned. No epidemic diseases.

QUINTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles L. Smith, Quinton; John T. Fowser, Quinton; Gilbert A. Ayres, Shiloh; William T. Good, M.D, Quinton; John F. Anderson, Assessor, Quinton.

We have nothing to report. There has been nothing done by the Local Board of Health. The inhabitants of the township have been healthy. No epidemic, except scarlet fever in the spring. There were three deaths by it.

SALEM CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Zaccheus B. Sickler, President; Josiah Wistar, Secretary; Clinton Bowen, Dr. Edwin Chew, Thomas Hewes; C. M. Sherron, M.D., City Physician. William Carney, Health Inspector. Post-office address of all, Salem.

The water-supply is the same as has been noted in former reports, the water for drinking and culinary purposes being, in a large majority of cases, obtained from private wells.

Another line of sewer was laid during the present year, so that the three principal streets have now the advantages of efficient drainage. In the sewer just referred to, as in those previously laid, terra-cotta pipes were used, the plans having been approved by Col. Waring, Sanitary Engineer. In every instance where sewers have been laid in our town a portion of the cost has been defrayed by subscriptions from the residents of the respective streets, the balance being paid by the city, and a moderate charge made to each person making a sewer connection. As previously mentioned, they are not designed for carrying off surface-water, but only for house drainage. As the surface of the ground varies so little from level, only a slight fall or grade is admissible for the sewers. House connections are being made from time to time; the importance of such connections being realized by very many of our citizens.

Houses are invariably built with cellars, which are generally dry, the exception being in an uncommonly wet spring. Houses are tenanted by one family only, and a general yearly inspection is made by our Health Inspector.

In the case of cesspools, they have been generally constructed with *open* sides and bottom, but an ordinance prohibits their being placed nearer than fifty feet to a well of water.

Several cases of diphtheria have occurred and some deaths. Thinking advantage would arise from a more general knowledge of our health ordinances, adopted some years since, this Board had those relating to *contagious diseases* printed in the form of a health circular and a copy left at every house in the town. To these were appended instructions as to treatment, &c. In one case the family was quarantined. The disease finally became extinct.

Several cases of the so-called hog cholera existed in some of the adjoining townships, but, so far as is known, not in the town.

Slaughter-houses are located at a distance from the built-up portions of the city. They are under the supervision of this Board, but have, of latter years, occasioned no trouble or complaint.

It is not *known* that any unhealthy conditions are traceable directly to any of our manufactories. The factories for canning tomatoes are all located immediately on the creek, into which the refuse passes.

JOSIAH WISTAR,
Secretary.

UPPER PENNS NECK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John M. Bevis, Chairman; Joseph Sailor, Edward E. Smith. Dr David Moore, Medical Member; Amos Morris, Assessor. Address of all, Pennsgrove.

Water is supplied by wells from eight to twelve feet deep; some very soft and good, some very hard with a scum over it. Drainage generally open ditches, trunks and some pipe. Some in not very good shape. Diphtheria prevailed in the Central district to some extent; quite a number of cases, seven deaths. It broke out about the first of March. The Central School closed on account of it. The Chairman of the Board of Health saw that the funerals were all private. Several cases of malaria and typhoid fever occurred in Pennsgrove. No ordinances passed, but will be another year. The Board has had a few complaints, and attended to them, and had but little trouble. It cleaned up some objectionable places, and it has improved the place very much. The people begin to understand as the town is building up and take more pride in keeping things clean than they did when it was a scattering village.

AMOS MORRIS,
Secretary.

UPPER PITTSGROVE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hiram W. Smith, President, Whig Lane; Henry Coombs, Elmer; Thos. Y. Hackett, Daretown; Moses J. Paulding, Physician, Daretown; Joseph N. Gray, Assessor, Pittsgrove.

The township is remarkably free from any epidemic or contagious diseases, and has been the whole year. This being a strictly agricultural community, no provision is made as to the suggestions in the cholera circular. The Board of Health for the township was organized April 11th, 1892. No other meeting has been held by the Board.

JOSEPH N. GRAY,
Assessor.

SOMERSET COUNTY.

BEDMINSTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Ralph Davenport, Chairman, Pluckamin; Erastus Randall, Bedminster; Lewis Van Dorn, Peapack; J. B. Beekman, Pluckamin; E. F. Farron, Peapack.

The condition of the health of the township is good. Since the last report no diseases of a contagious or malignant nature have been with us. Our physicians have used great zeal in urging cleanliness and other sanitary measures as a due guard against cholera, all of which is highly appreciated by the Board.

Since our organization in March, our Board has held three meetings. At the June meeting the following order was issued and duly promulgated: Anything dangerous to the public health—that is, whatever affects ground, water or food, or impregnates the air, by any of the inhabitants of the township of Bedminster, either through neglect, willfulness, or otherwise, either by the pollution of any stream, reservoir or spring of water used for drinking or other purposes; offensive odors from drains, sewers and water-courses; accumulations of garbage; neglect to properly bury dead animals; neglect to properly clean water-closets and cesspools, or uncleanliness of tenant-houses and grounds—shall be deemed a misdemeanor against the health laws of the State of New Jersey, and failure to comply with each or any of the above requirements, after due notice from the Board, shall subject the person or persons so failing to a fine of twenty-five dollars.

This order, though comprehensive, signed by the members of the Board and duly published, certainly had a good effect. We have had but few complaints within the year, and in every instance the complaint was removed by notice from the Secretary or some member of the Board.

WM. P. SUTPHIN,
Secretary.

BERNARDS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Malcolm Thompson, Chairman, Bernardsville; J. E. Ballentine, Secretary, Bernardsville; Freeman Stelle, Millington; John A. Layton, Liberty Corner; Calvin Thompson, Basking Ridge; Dr. A. F. Voorhees, Basking Ridge.

Have no public water-supply. People depend on wells and cisterns.

There is no system of drainage.

Houses are generally fitted up with cellars; and in winter are used for storing vegetables. There are but few tenement-houses with more than one family. There is no yearly inspection of houses.

There were two cases of glanders, both on December 26th, 1891, and both slaughtered on December 31st, by J. Gerth, Jr., Veterinary

Surgeon. The stables were torn down and burned up. The water-boxes were quarantined and torn down.

The slaughter-houses are inspected regularly.

The school-houses are all perfect as regards sanitary arrangements, and the water-closets are carefully looked after.

No ordinances have been passed.

The Board of Health ordered all unvaccinated children to be vaccinated last December, 1891. This order was given to all District Clerks.

The prevalent diseases were grip, mumps and measles.

All the duties required were systematically attended to.

J. E. Ballentine,
Secretary.

BOUND BROOK BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. Howard Perry, President; W. S Negus, Secretary and Treasurer; John M. Rowland, C. R. P. Fisher, M D. Charles McNabb, Health Inspector. Post-office address of all, Bound Brook.

Situated on the easterly side of Somerset county, south of the range of the Blue mountains running through the State, and on the north side of the Raritan river. Population about 1,500. Climate milder than some points on account of being sheltered from the north winds by the range of mountains.

Rolling surface; gravelly and sandy subsoil.

Water supplied by two large spring brooks that are dammed about two miles from town, and the water comes by natural gravity.

No sewerage, except the natural surface drainage, although a system of perfect sewerage is now being agitated.

We are at present having our old town brought to a regular grade and the streets are not in a very good sanitary condition, but will be when the grading is finished.

We have no tenement-houses, strictly speaking, but quite a number of houses where the first story is a store and each floor above occupied by a single family. Quite a number of cheap boarding-houses, run by Italians, Poles and Hungarians, for workers in the mills and on the railroads.

The borough is lighted by electricity.

The refuse, *i. e.* ashes, dirt, &c., is used for filling up. The excreta has so far been used for manure.

Large brick public school in good sanitary condition. No other public building.

One large cemetery, used by all denominations except the Roman Catholic.

The public health is good at present and has been for some months previous. The Board has passed ordinances.

Have not had any contagious diseases since we organized, except one case of diphtheria. If we had a case of cholera we expected to isolate it as much as possible on top of the mountain.

Have had a great deal of throat trouble in a mild form. Only one case of diphtheria.

The Board received fifteen complaints up to October 15th, all of which were investigated, and upon due notice being given the nuisances were abated within the time allowed. Most of the complaints were of foul-smelling privies, cesspools running over and piled-up and decaying house refuse.

CHARLES MCNABB,
Inspector.

BRANCHBURG TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theodore J. Starner, Chairman, North Branch; William H. Dolliver, Neshanic Station; George S. Corle, Neshanic Station; Adonis Nelson, M.D., Neshanic Station; E. Brokaw, Secretary, South Branch.

With the exception of several cases of measles during the months of March and April and three fatal cases of spinal disease among horses, "all in the same stables," we have nothing new to report. The Board organized May 14th, 1892. No complaints have been made to the Board during the year.

E. BROKAW,
Secretary.

BRIDGEWATER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alex. H. Brokaw, Raritan; C. L. Voorhees, Somerville; Dr. A. L. Stillwell, Somerville; Wm. K. Hope, Raritan; John T. Pattison, Bound Brook. Dr. A. L. Stillwell, Health Inspector.

The sanitary condition of the township is good. The Board find very much improvement in the sanitary condition of Somerville, owing to the construction of sewers last year, which have been extended to other parts of the town this year, and have also been the means of doing away with numerous private drains and cesspools which heretofore were objectionable, but, at the same time, necessary.

We have had a few cases of diphtheria, scarlet and typhoid fever, but not prevalent or fatal.

The Board has adopted the method of furnishing printed postal cards to physicians, to report contagious diseases, in order to get a thorough knowledge of all such cases.

We have had ten (10) cases of small-pox and varioloid during the year, but prompt action by the Board prevented any spread of the disease. None proved fatal.

In regard to precautions against cholera, the Board issued a circular and had it thoroughly distributed, warning people to use every precaution available to guard against the disease, and also had all places that were not in good condition cleaned and disinfected.

C. L. VOORHEES,
Secretary.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

President, T. R. Hodge, Bound Brook; John Tetten, Middlebush; Dr. J. W. Voorhees, East Millstone; John Stotoff, Middlebush; Dr. J. Howard Cooper, Middlebush.

The water is supplied by wells dug sufficiently deep and cleaned as often as necessary. Some of the water contains quite a quantity of iron. There are no cisterns in use for the supply of drinking-water. Nearly every house has a drainage-pipe which carries away the dirty water, &c., to a lower level, where disinfectants are used as necessary. No sewerage. The cellars are dry, except in very wet seasons. All houses have cellars under them, which are mostly used for storage of vegetables. There is no yearly house-to-house inspection. The Assessor looks after the loss of animals and contagious diseases. If necessary the slaughter-houses are inspected. The Local Board of Health has passed the health ordinance provided by the act of the Legislature. During the present year the Board has controlled one case of small-pox—put it under quarantine—and there were no more cases, and had everything in very good working order. The Board also was called out to inspect the premises of an individual who carted night-soil, and spread it on top of the ground, and didn't cover it. It proved to be a nuisance, consequently the owner was forbidden carting any more unless he put it in a pit and mixed it with lime and soil. We have the same provision in this township for cholera as all other country places. There have been no cases of the diseases of animals in Franklin township of either epidemic or endemic character that have come under our observation and the losses from different diseases have been no greater than usual.

T. R. HODGE,
President.

HILLSBOROUGH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph H. Van Cleef, Hillsborough; Peter J. Quick, South Branch; J. V. D. Smith, Weston; John Oakey, Hillsborough; W. H. Merrell, M.D., South Branch, Secretary.

The public health has been good, except from December 25th to February 25th, when la grippe prevailed more extensively and more seriously than ever before; still, there were very few deaths.

Sanitary expenses have been trifling, as in an entirely rural section there is little to do for the Board of Health.

The Board organized May 28th. Once since it was called on to abate a nuisance connected with a photographic concern. The last meeting was held October 20th.

As we have no village containing more than 150 inhabitants the Board did no work against the cholera except to distribute circulars of the State Board.

W. H. MERRELL, M.D.,
Secretary.

MONTGOMERY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Isaac Williamson, Rocky Hill; Jacob S. Hoagland, Harlingen; Stephen S. Voorhees, Blawenburg; William Oppie, Assessor, Harlingen; Abram B. Mosher, Griggstown.

During the last year our Board has not been called out. Consequently we have nothing in particular to report. The general health of the township has been good. No nuisances have been reported.

WILLIAM OPPIE,
Secretary.

NORTH PLAINFIELD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Rev. Wm. E. Honeyman, President; Rev. T. Logan Murphy, P. M. French, B. S. Braider; J. H. Carman, M.D., Secretary.

The past year has been a very healthy one to the inhabitants of North Plainfield. Aside from la grippe, which prevailed during the winter and early spring, and the usual spring crop of measles, no epidemics have occurred. Have had a few sporadic cases of scarlet fever, and one case of small-pox appeared in the borough in May, but was prevented from spreading by rigid quarantine. The Board of Health advised the vaccination of all school children who had not been vaccinated within five years, and, with very few exceptions, found parents willing and anxious to take such advice.

J. H. CARMAN, M.D.,
Secretary.

WARREN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. J. Lang, John D. Barnman, Peter Bowers, Peter J. Zeglio; Joel Codington, Assessor. Post-office address of all, Warrenville.

The Board of Health met and organized on the usual day; nothing of importance came before them. There have been no prevalent diseases, as we are situated in a hilly country.

SUSSEX COUNTY.

ANDOVER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Levi N Space, Chairman, Newton; George Young, Treasurer, Andover; Charles Gardner, Andover; Green C. Cook, Assessor, Andover; J. C Clark, M.D., Medical Member, Andover.

Sources of water-supply are wells, springs and cisterns.

No system of drainage. Cellars dry. No swamps near detrimental to public health.

Houses, generally, have basements or cellars, largely used for storage. No tenement-houses of more than two families.

No sewers. Cesspools are few. Excavations with open bottom and sides, filled with stones, seldom emptied, occasionally abandoned, and new ones constructed.

No contagious diseases.

No slaughter-house nuisance complained of.

No ordinances passed.

Have no report to make, further than that I receive no aid or assistance in anything pertaining to sanitary investigations from members of the Local Board, or our medical member.

The health of the population of the township has been good.

G. C. COOK,
Assessor.

BYRAM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John D. Lawrence, Chairman, Stanhope; Robert Slaght, Stanhope; Watson McPeake, Stanhope; C. K. Davisson, Medical Inspector, Stanhope; D. W. Goble, Secretary, Andover.

Water-supply mostly from springs, and some wells; waters pure and healthy, and mostly all impregnated with iron.

Drainage natural and rapid; no sewers.

Houses mostly have cellars, and used for storing vegetables.

No losses of animals by contagious diseases.

The slaughter-house owned and operated in the village of Stanhope has been a nuisance all summer. The Board of Health of the township met on the 7th day of October, 1892, and served a notice to abate the nuisance in thirty days, and so the matter stands at present.

No ordinances passed by our Board.

Our Board has had regular meetings every time the committee meets, and has had but two complaints. One was abated, and the other stands as reported.

DANIEL W. GOBLE,
Assessor.

DECKERTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

B. P. Walling, Jacob Guild, A. P. Wood, D. M. Dickerson, D. Everitt. Post office address of all, Deckertown.

These are the Council. A Board of Health has not been regularly organized.

FRANKFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Oscar Northrup, Augusta; Jacob A. Coursen, Branchville; J. C. Price, M.D., Branchville; George Phillips, Assessor, Branchville. E. S. Dalrymple, M.D., Health Inspector.

Water-supply in the village is obtained principally from wells and cisterns; no public supply. Excreta disposed of chiefly in vaults, which, in most cases, are situated dangerously near the wells. No system of drainage. There have been no contagious diseases of domestic animals. No epidemics except la grippe, which was prevalent during winter and spring. Public school buildings in good sanitary condition. Vaccination has been neglected. Only one complaint (of a trivial nature) has been made to the Board during the year. No ordinances have been passed. No provisions whatever have been made in case of cholera.

E. S. DALRYMPLE, M.D.

GREEN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

M. S. Hibler, Huntsville; G. I. Laing, Tranquility; W. C. Gray, Huntsburg; Job J. Decker, Assessor, Andover; Sidney B. Straley, M.D., Andover.

Green township is situated between Andover township, Sussex county, and Warren county, and has a population of 636. The climate is good.

Slate ranges cross the northern end of the township, gray rock is found in the southeast, and in the middle limestone abounds. A large deposit of marl and deposits of iron are found in the southeastern end of the township. Marble in small quantities has been found near Huntsville, but it is of an inferior quality. Traces of other minerals are found.

The main bodies of water are Reading's pond, Hunt's lake, Decker's lake and Turtle pond. The Pequest river has its source in Green, Andover and Byram townships, and traverses the township from east to west. The land is mainly rolling, and well drained.

Water-supply is from springs and wells, chiefly the latter, while cistern-water is used a great deal for cooking purposes.

Sewerage receives but little attention. Vaults are used for excreta, and when full are either covered over with earth or emptied and ploughed under.

Very few houses have more than one family.

There has been no epidemic disease among the animals during the past year.

There is one slaughter-house, but no complaints have been made.

There are five schools in the township; the buildings are in good shape.

Quarantine measures are in loose shape. The law compelling vaccination is not enforced, and quite a large percentage of school children are not vaccinated.

Prevalent diseases for the past year—whooping-cough, la grippe, pneumonia.

The Board advertised its meetings, but no complaints have come in during the year.

The Board organized March 12th, 1892, with M. S. Hibler, Chairman, and J. J. Decker, Secretary. August 18th, Dr. S. B. Straley was elected medical member of the Board.

S. B. STRALEY, M.D.

HARDYSTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Horace E Rude, President, Hamburg; John Linn, Jr., Secretary, Hamburg; O. Bunn, Monroe; John A. Paulison, Stockholm; J. B. Pellet, M.D., Hamburg.

Location, northern part of State, in Sussex county. Wells and cisterns give water-supply. Location healthy and not crowded. Public health good; no special regulations.

No quarantine regulation; vaccination generally disregarded. No epidemic diseases. The only complaint made to the Board during the year was made by some of the residents against a public nuisance, caused by keeping a lot of hogs at a creamery in Hamburg. Upon notice from the Board the nuisance was abated.

JOHN LINN, JR.,
Secretary.

HAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Moses Ackerson, Halsey; Abram S. Morris, Halsey; John S. Coursen, Newton; Jacob R. Stoll, Blair.

There has not been anything done by the Board, nor have there been any sanitary improvements.

MOSES ACKERSON,
Assessor.

LAFAYETTE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel Warbasse, Lafayette; John M Hall, Lafayette; Nelson Ackerson, Lafayette; William R. Case, Beaver Run.

MORTAGUE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Timothy Shay, Montague; Joseph S. Hornbeck, Montague; Santford Nearpass, Tristates, Orange county, N. Y. William P. Hornbeck, Assessor, Montague.

There have been no special meetings of the Board the past year. There have been no complaints.

NEWTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Andrew B. Brickner, Charles S. Steele, Patrick Devaney, George Hardin. Post-office address of all, Newton.

SANDYSTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

Henry M. Ellitte, Layton's; George E. Hursh, Layton's; James M Stoll, Hainesville.

SPARTA TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. T. Dolan, Ogdensburg; John H. Sutton, Monroe; John W. Masker, Sparta; E. Munson, Assessor, Sparta.

Nothing has been done. No Board of Health organized. Our town is in a first-class condition. No contagious disease has existed the past year. Our climate and water are such as to draw more people from the cities through the summer months than we can accommodate.

EDGAR MUNSON,
Assessor.

STILLWATER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jesse Sherred, Swartswood; Obadiah Van Horn, Stillwater; David R. Swazey, Fredon; John S. Obdyke, Stillwater; A. C. Huff, Middleville; Jos. L. Hetzel, M D., Stillwater.

The Local Board of Health of this township met at Swartswood on September 24th. Due notice of such meeting was given through the county paper. No complaints were made. There have been no diseases of animals. Malarial diseases are on the decline; very few cases have occurred.

Cholera morbus prevailed through the month of September and part of October, resulting in one death. The general health has been good.

There has been no business before the Board the past year.

JOS. L. HETZEL, M.D.

VERNON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. S. Blanchard, Assessor, Vernon; A. P. Shaw, Vernon; Abram Van Winkle, Glenwood. C. Allen, M.D., Physician and Health Inspector, Vernon.

Our township is occupied by a rural population, having but three small villages of less than 200 population each. The villages are Vernon, Glenwood and McAfee Valley. In the last-named are a few lime kilns. In support of these, perhaps twenty-five hands are employed in quarrying the rock and burning lime; perhaps twenty-five more in chopping wood and carting to the kilns. With these exceptions, our whole population is engaged in agriculture, with the usual proportion of mechanical trades. But one physician resides in the township. Our sanitary status is believed to be as good as can be found in any rural community. No epidemic has visited us in many years. We have a Board of Health organized according to law, but we have no occasion to call them together.

As to cholera, would say that our town is no thoroughfare for strangers, nor stopping-place for immigrants. We hold ourselves in readiness to move whenever occasion requires it, and this is about all we feel warranted in doing at present.

A. S. BLANCHARD,
Assessor.

WALPACK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Elijah Gariss, Flatbrookville; Nathaniel Van Auken, Flatbrookville; Nicholas Tillman, Walpack Centre.

There is nothing to add to former reports. The general health of the township has been very good. There has been no disease among animals.

J. W. BUNNELL,
Assessor.

MONTAGUE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hon. Jacob Swartwout, Deckertown; Jonathan Coykendall, Deckertown; Frantz V. McCoy, Deckertown; Newman Hall, Clerk, Deckertown; J. S. Woolf, M.D., Coleville.

In making my annual report, I have to inform you that since last report the village of Deckertown has been organized into a borough separate from the township, and with a full board of officers. I know of nothing new to report. There have been no prevalent diseases or contagious diseases among cattle. Slaughter-houses are as they should be. Last meeting of Board held 28th of May last. No complaints before the Board this year. Circulars as to cholera have been distributed.

NEWMAN HALL,
Assessor.

UNION COUNTY.

CLARK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Marx Reifel, Andrew Gibson, George Cordeo, F. P. Bullman. Post-office address of all, Rahway.

The Board of Health of the township of Clark has not met since its organization this year. There have been no complaints and no business to transact. The township is settled mostly by farmers and a few business men. Dwellings far apart and each having its own supply of water from wells and cisterns. No prevalent diseases of people or animals. Very little sickness and but three deaths, all far advanced in life.

F. P. Bullman,
Assessor.

CRANFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edmund Burke Horton, President; Emmor K. Adams, Charles N. Drake, Edward S. Crane, Elias W. Haddon, J. K. McConnell, M.D.; Gideon E. Ludlow, Secretary. Post-office address of all, Cranford.

We have adopted a Health Code in conformity with the recommendations of the State Board, and have found our townspeople, as a general thing, disposed to yield a hearty support in carrying out its provisions. So far as I have been able to observe, our township has been very healthy throughout the past year.

Edmund Burke Horton.

ELIZABETH CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. Whelan, President; William M. Mark, M.D., John T. Donohue, James S. Green, M.D., William Birnie, Jr.; James T. Manning, Secretary. E. G. Putnam, Health Inspector, City Hall. Post-office address of all, Elizabeth.

Had slight epidemic of measles in the spring. Less cases of other infectious or contagious diseases than the previous year. Have adopted a new system of plumbing regulations as per circular of State Board of 1888. Total cases of scarlet fever during the year, 30; diphtheria, 12; diphtheritic croup, 7; measles, 1. Vaccination enforced in public schools. Have house-to-house inspection. Have built sewers through Pine, Bond, Fulton and some other streets that were in very bad condition, and have enforced connections from premises with them. During cholera scare had Elizabeth river cleaned and filthy gutters cleaned and flushed with water.

E. G. Putnam,
Health Inspector.

FANWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hon. Geo. Kyte, Fanwood; L. W. Miller, Scotch Plains; Wm. Terry, Plainfield; John Robison, Scotch Plains; F. W. Westcott, M.D., Scotch Plains.

We have nothing new to report. This has been another healthy year. The work of the Board of Health has been light; all cases of complaint being promptly attended to and the cause of complaint promptly removed. Our Board desire to express their appreciation of Circular No. 45 (cholera). On receipt of same we had our cesspools, &c., thoroughly examined, and, where needed, cleaned. Think we are in good sanitary condition. We have no hospital for contagious diseases, but, if needed, have no doubt but same would be provided and the unfortunates properly cared for.

F. W. WESTCOTT, M.D.

LINDEN BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Gulager, Chairman; Rev. Oscar Gesner, Secretary; Ernst A. Knopf, Parnenus Rue, Hon. Ferdinand Blancke, John A. Etheridge. Post-office address of all, Linden.

In the borough there has been but little sickness, and no contagious diseases. The Board meets the last Saturday in every month.

JOHN A. ETHERIDGE,
Secretary.

LINDEN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Spinning, Chairman, Elizabeth; Henry McCandlass, Elizabeth; Moses W. Mulford, Roselle; Milton B. Crane, Roselle; John Macdonald, Roselle; William H. Donalson, Linden; John P. Winans, Tremley; Robert A. Shotwell, Rahway; Dr. Henry C. Pierson, Medical Member, Roselle. William Reynolds, Health Inspector, Roselle.

The health of the township has been unusually good the past year. But one case of scarlet fever, and that case proved fatal. The Health Board meets the first Saturday in every month. Two or three cases of defective house drainage reported. Through the immediate attention of Secretary Donalson and Inspector Reynolds the same was abated. A great deal of trouble is experienced in collecting birth returns.

JOHN A. ETHERIDGE,
Assessor.

NEW PROVIDENCE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John M. Badgley, Chairman, New Providence; Samuel R. Valentine, New Providence; Lewis Bergmiller, Berkley Heights. A. M. Cory, M.D., Secretary and Inspector, New Providence.

The Board of Health was organized in June, and no formal meeting has been held since.

A few cases of cholerine have occurred, tractable and non-contagious.

On complaint the pollution of a small stream from house and cesspool drainage has been prohibited. Attention has been paid to such matters in several instances.

No provision has been made for the isolation and care of cholera cases, but would be promptly made in case of necessity.

The health of the community has been good, excepting the prevalence of la grippe last winter and spring.

A. M. CORY, M.D.,
Inspector.

PLAINFIELD CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Rockfellow, President; Lemuel W. Serrell, Henry B. Newhall, G. W. Endicott, M.D.; Oliver B. Leonard, Secretary. M. Marion Dunham, Health Inspector. Post-office address of all, Plainfield.

The Board holds monthly meetings to transact regular business and consider questions relating to the sanitary condition of the city. They have been especially careful to urge frequent and thorough inspections of back yards and outhouses. Fumigation and disinfectants have been vigorously applied in all cases where they were required. The Health Inspector has been daily on the alert to prevent the accumulation of deleterious substances. Four hundred and eighty personal inspections were made by him within twelve months, ending October 1st, 1892. There have been cleaned out 369 privy-vaults and 533 cesspools emptied.

The question of sewerage in Plainfield has received renewed and intelligent attention the past year. A representative committee, composed of practical men from the Common Council, Board of Health and city at large, has been considering the problem, a solution of which is soon expected to be reached.

The public water works are increasing in favor with the citizens, as is evinced from the growing number of house takers.

The streets in the more thickly settled parts are well sprinkled and kept clean. Many thousand feet of macadamized roadways have been laid and all repairs are made with crushed trap-rock.

Our public school-houses are five in number, of brick, spacious, well heated and ventilated, and accommodate a large percentage of the children of school age.

An unusual degree of healthfulness has characterized the city since last statement. There has been no epidemic of any disease. Probably the increased activity exercised in the house-to-house inspections, prompted by the presence of cholera in New York, has averted many preventable cases of sickness. During the year only one hundred instances have been reported of contagious diseases, and these mostly measles and light form of scarlet fever among the children. Vital statistics are regularly collected and a careful registration made.

OLIVER B. LEONARD,
Secretary.

RAHWAY CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. C. B. Holmes, President; Dr. H. Page Hough, Dr. J. M. Randolph, H. B. Rollison, and D. K. Ryno. S. Rusling Ryno, Secretary and Inspector. Post-office address of all, Rahway.

Present population of city estimated at 10,000. Water obtained from Rahway river through system of works owned and operated by the city. Supply always abundant and pure, with no visible falling off in quantity from the drought of the past summer. Pipes kept clean by "blowing out" twice yearly. The city is drained by sewers which empty into the river below the water works, and, as the river is affected by the tides, the sewage is readily carried off. Especial care has and will be given to keeping the sewers, sewer-basins and any other drains in a cleanly and healthful condition. The general health of the city during the past year has been good. Contagious diseases have not been prevalent, prompt report being required when any such exist, in order that a proper quarantine may be established. The police have instructions to report any violation of sanitary laws, and the registration of vital statistics is enforced as required under the law. Fearing a possible visitation of the cholera, steps have been taken to put the City Hospital building in proper shape for use if required. A general cleaning up of the streets and of all places where garbage or refuse matter has been allowed to collect has been effected. Notices have been posted by the Board of Health in various places, warning all persons not to dump or deposit decaying vegetables or any other foul or rotten matter where, by so doing, it would be a source of danger to the public health.

S. RUSLING RYNO,
Secretary and Inspector.

SPRINGFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

N. C. Cox, Abner Stiles, A. P. Carter; J. J. Hoff, Secretary. T. W. Harris, M.D., Health Inspector. Post-office address of all, Springfield.

The water-supply of the town is from wells and cisterns.

The sewage is disposed of by cesspools and privy-vaults, most of which are well taken care of and cleaned as often as necessary,

There are but few houses that are occupied by more than one family.

No disease among animals.

No slaughter-house.

One of the rooms used as a school-room was visited by the Inspector and found much overcrowded and withal entirely unfit for school purposes. The Board notified the Trustees of the district to that effect, and we trust that they will soon provide more healthy quarters for the school.

The Board has had meetings and has attended promptly to any complaints which have been made to it, and have uniformly had their requests for the abatement of nuisances promptly complied with.

The year has been an exceptionally healthy one. No prevailing diseases.

T. W. Harris, M.D.,
Health Inspector.

SUMMIT TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

P. W. Page, Chairman; Dr. W. H. Risk, Physician; J. W. Reeves, Assessor; J. H. Kelly, J. A. Hicks. W. H. Risk, Health Inspector. Post-office address of all, Summit.

Nothing new reported except the construction of a new sewer system.

UNION TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Tunison, Lyons Farms; John Leonard, Union; James B. Woodruff, Roselle; D. Hobart Sayre, Union.

Since last report there has been no complaint of violation of health ordinances.

Have held advertised meetings in accordance with law, and have adopted a Sanitary Code on lines recommended by State Board.

Health of community has been above average.

Drouth has caused limited water-supply in some sections.

No disease has become epidemic or called for action on part of Township Board.

D. Hobart Sayre,
Secretary.

WESTFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Addison S. Clark, N. B. Cardner, Chas. F. Connant, John M. C. Marsh, Jos. B. Harrison, M.D. Post-office address of all, Westfield.

WARREN COUNTY.

ALLAMUCHY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel H. Drake, Charles M. Townsend, Mathias Hibler, Chairman; B. A. Hendershot, Township Clerk. Post-office address of all, Allamuchy.

Located at the foot of Allamuchy mountain; population in 1890, 759; climate salubrious. Well-water used. Natural drainage. No disease of animals. No slaughter-houses. Large school-house, well ventilated. The Board has looked after condemned water-closets, &c.

BELVIDERE.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James A. Arthur, President; Daniel G. Heffner, Secretary; Wm. J. Burd, M.D., Treasurer; Joseph S. York. John H. Robeson, Health Inspector. Post-office address of all, Belvidere.

Population about 1,800. Situated on the east bank of the Delaware river, at the confluence of the Pequest creek with the Delaware. The soil is sandy, and not very thick, beneath being a solid bed of limestone.

The water-supply is excellent; it is from the Delaware, being pumped into a stand-pipe 160 feet in height, and distributed therefrom.

The drainage and sewerage are fairly good; there are a number of private sewers, and nearly all the newer houses have sewer connections; these sewers empty either in the Delaware or Pequest. There are several cesspools, some of which were found, on inspection in the summer, to be in a very filthy condition indeed. These were corrected, but not abated.

A large and well-arranged brick building has recently been completed for the public school.

The county jail here was in a wretched condition during the summer, on account of defective sewerage. The Sheriff's house is in the same building, and there is no doubt but that the Deputy Sheriff lost his life from this wretched jail, he having died in the summer from typhoid fever. The Board of Freeholders, after considerable delay, corrected the sewerage. The jail is a most miserably-constructed affair—practically no way of ventilating it at all; in fact, nearly all the foul air from the jail comes out into the halls of the Sheriff's house. The attention of the Board of Freeholders has been called to this matter by our Health Inspector, but so far nothing has been done.

All contagious diseases are reported to the Board of Health, and a record is kept of these cases. Vaccination is very much neglected.

Last winter the prevailing influenza raged here, as elsewhere, but there were very few fatal cases from it; not as many, in proportion to the number of cases, I am inclined to think, as elsewhere.

There were several cases of typhoid fever during the summer, and one death from it. This fall there has been a slight epidemic of scarlet fever of a mild type.

Our Board has begun a very good work here, but there is much more to be done. We could have done a good deal more if we had had the hearty co-operation of the town authorities.

WM. J. BURD, M.D.

BLAIRSTOWN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Hoagland, Blairstown; John I. Blair, Blairstown; J. J. Linaberry, Blairstown; Joshua Jones, Walnut Valley.

No organized Board of Health. We have a very healthy locality. No complaint has been made in regard to any nuisance.

J. J. LINABERRY,
Assessor.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Marshall Hofman, Asbury; James Smith, New Village; Alvin Walker, Broadway.

FRELINGHUYSEN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Stickler, Johnsonburg; John V. Allen, Marksboro; Reed Kerr, Johnsonburg; F. Borback, M.D., Johnsonburg; W. H. Ackerson, Johnsonburg.

There is no regular, organized Board of Health in our township. We have no villages of over two hundred inhabitants. It is a very healthy township. There has been no epidemic in the past year.

W. H. ACKERSON,
Assessor and Health Inspector.

GREENWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. P. Kinney, Stewartsville; Philip Hance, Bloomsbury; R. I. Smith, Bloomsbury; William Sherrer, Bloomsbury; Enos E. B. Beatty, M.D., Stewartsville.

We have made no provisions in cases of actual cholera. No hospital or vacant house for cholera patients. No disinfecting corps. Do not know of any one that would take care of a cholera patient.

Last meeting, August 16th, was called for the purpose of hearing complaints in regard to public nuisances. No one appeared to make any complaints. So we took it for granted that everything was in pretty good shape.

Permission was given the Bloomsbury Cemetery Association to lay out and open a tract of about eight acres, to be used for a cemetery, within the township.

Do not think it will be necessary to appoint an Inspector.

WILLIAM SHERRER,
Secretary.

HACKETTSTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Smith, A. H. Dellicker, A. W. Cutler, Dr. A. E. Martin, Dr. John S. Cook, James Tamblyn, Thomas Nolan. J. M. Everitt, Inspector. Post-office address of all, Hackettstown.

Water-supply reservoir, owned by the town; nearly all the houses take it; no iron taste; soft water, very good the year round; reservoir and pipes cleaned occasionally; examination of stream made quite often; very few, if any, depend on wells; few cisterns, if any; Board of Health has no list of houses that do not use the public water-supply.

The usual water-level is such as to secure dry cellars. But one or two swamps near the town. Very seldom a case of malaria.

Houses generally have cellars; few basements occupied. About thirty-five tenement-houses of more than two families. No yearly house-to-house inspection.

No prevalent diseases this year.

Slaughter-houses are inspected.

No new manufactories this year.

Board has passed no ordinances.

No contagious diseases during the year, and vaccination general.

Passed a resolution prohibiting the dumping of ashes and all garbage in the streets; examined and inspected a slaughter-house complained of, but found no cause for complaint; abated the nuisance of throwing waste-water and slops of various kinds into the gutters of a street, and built a cesspool.

A. C. PROTZMAN,
Clerk.

HARDWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Hiram France, D. R. Nieman, J. D. Lanterman, Philip Savercool. Post-office address of all, Blairstown.

Nothing has been done towards organizing. Our township lies up in the mountainous part of the State. Has no towns in it. Have had no contagious diseases. We have very little sickness and comparatively few deaths. We have had no serious cases of sickness in a year.

PHILIP SAVERCOOL,
Assessor.

HARMONY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James W. De Witt, Harmony; Henry Metz, Harmony; Ralph Rush, Montana; C. Pittenger, Montana. J. D. De Witt, Montana, Health Inspector.

No complaints have been made to the Board this year. The report of last year will apply to this year, except an epidemic of scarlet fever and diphtheria, commencing February 5th and ending July 20th. Forty cases in all. Three deaths; two in one family.

J. D. De Witt, M.D.

HOPE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George G. Depue, Mt. Hermon; Isaiah B. Hildebrant, Mt. Hermon; Henry Aten, Hope; R. M. Van Horn, Assessor, Hope; John Miller, M.D., Medical Member, Hope.

Natural drainage. Some swamps, but no prevalence of malaria.

Houses have cellars, and are used largely for storage of vegetables. No tenement-houses of more than two families. No yearly house-to-house inspection.

No sewers. Privies rarely emptied.

No prevalent diseases.

Slaughter-houses not inspected, but of personal knowledge can assert they are no nuisance.

No ordinances. Public health good.

There has been no regular meeting or formation of the Board of Health. Some matters were talked over at the meeting of the Township Committee on August 16th. No particular sanitary measures have been deemed necessary. All deaths and sickness seem to be accounted for from natural causes.

R. M. Van Hart,
Assessor.

INDEPENDENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Stickler, Johnsonburg; J. R. Kerr, Johnsonburg; George Armstrong, Marksboro; C. H. Albertson, Assessor.

We have no organized Board of Health. Our township is located in the northern part of Warren county; population about 800.

Rural—no large villages. Hilly and mountainous, excepting Great Meadows. Good supply of good spring and well-water.

Healthy generally. Have had no epidemic diseases.

C. H. ALBERTSON,
Assessor.

KNOWLTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

G. Milton McCracken, Polkville; John Henry Albertson, Delaware; Andrew N. Van Horn, Hainesburg; Ephraim Dietrich, Secretary, Columbia.

We endeavor to observe all the State laws and all the regulations of the State Board pertaining to the public health. Our Local Board of Health has adopted a code of health regulations, and this very fact has done much to simplify the work of the Board, and fewer meetings have to be held in consequence.

The Board organized at the spring meeting of the Town Committee as above, and appointed the annual meeting for the hearing of complaints, &c., as required by the act of 1892, to be held at Columbia, August 9th. At this meeting there was but one complaint made, of a nuisance in the form of an offensive pig-sty. Upon investigation by the Board, it was found that there was just cause for complaint, but a notice from the Board, with reference to our code and the penalty for its violation, caused the nuisance to be abated promptly.

There have been no prevalent or contagious diseases in the township during the year.

EPHRAIM DIETRICH,
Assessor.

LOPATCONG TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Amy, Edwin H. Paulus. John Hamlin; Rowland Firth, Assessor; Isaac Barber, M D. Post-office address of all, Phillipsburg.

Our report is substantially the same as last year. There have been no signs of an epidemic among either people or cattle. We have a remarkably healthy location, so there is not much for a Health Board to do except in cases of epidemic.

R. FIRTH.

MANSFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Nicholas Martenis, Port Murray; Edward S. Morlatt, Karrville; William H. Thompson, Beatystown; James Beaty, Assessor.

OXFORD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George A. Wildrick, Oxford; John H. Hildebrant, Belvidere; Wm. Miller, Jr., Oxford; Charles Wiseburn, Oxford; L. B. Hoagland, M.D., Oxford.

There having been no epidemics in our township during the past year, we have nothing special to report.

The Board has had but little work to do, except to abate a few minor nuisances, which was promptly done as soon as they were notified of the same.

L. B. HOAGLAND, M.D.,
Secretary.

PAHAQUARRY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Zimmerman, Calno; Moses Depue, Calno; Jason K. Hill, Millbrook; Ambrose Van Campen, Millbrook.

PHILLIPSBURG.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Crawford Parker, W. H. Carey, W. G. Tomer; John Warner, President; Dr. A. P. Jacoby; Frank Kneedler, Secretary. W. H. Dickey, Health Inspector. Post-office address of all, Phillipsburg.

Water-supply is of the best.

The town has been partly sewered. The system is not complete, but the drainage is very good.

Streets have been thoroughly cleaned and are in a healthy condition.

Have made a house-to-house canvass and found houses and cellars very clean. Have had about one hundred water-closets cleaned during the summer.

The town is lighted with electric light and gas.

Refuse is taken along the river, where it is deposited and buried.

No diseases of animals.

Slaughter-houses have all been examined and are kept in good order.

No alms-house. No hospital.

The public health has been generally good.

The laws and regulations have been very much improved during the past year.

Care is being taken to quarantine contagious diseases.

There have been about forty cases of scarlatina of a mild form and about thirty cases of diphtheria reported during the year.

We have made arrangements for cholera should any be reported. Have a vacant house on the outskirts of town.

Our Board has been doing good work during the past year. We have passed an ordinance allowing no one to keep hogs in the town limits after the 1st of January. The physicians are reporting all contagious diseases and are very careful to keep the schools free from the same.

POHATCONG TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Snyder, Riegelsville; William Case, Shimers; John Hughes, Carpentersville; Marshall Hawk, Shimers, Assessor.

It is not necessary or possible for me to follow the regular formula given on first page, because ours is a township with only four or five small villages or towns.

The township has been very healthy this year. We have had two cases of scarlet fever, one near Warren Paper Mills and the other at Finesville, which were fatal; also two cases of typhoid fever, not fatal.

Most all our people use cistern-water. Two or three families use Delaware water.

We have the best of drainage.

The undertakers of neighboring towns and townships neglect to return the death reports that they use as burial permits when officiating in our township.

MARSHALL HAWK,
Assessor.

WASHINGTON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Stites, M.D., President; F. P. McKinstry, M.D., John Hornbaker, George C. Campbell, Levi Bowlby, A. J. Bigler. F. P. McKinstry, M.D , Health Inspector. Post-office address of all, Washington.

Our water-supply, as to source, &c., has been fully described in past reports. Naturally, the water is of the best quality, but recently its color and taste have excited suspicion, and examination showed an excess of organic matter of vegetable origin. Our Board visited the reservoir and found a large filth deposit in the basin. The water company gave the reservoir a thorough cleansing, and promised to act on our suggestion as to storage in the future. We shall hereafter keep the matter under close observation.

Since our last report, we have made a beginning in the matter of sewerage. For years a private sewer had emptied into a small stream running through the center of town. As population increased, one attachment after another was made (most generally at night), until it became a nuisance. About two years since, the Board forbade any further attachments, and ordered the whole system discontinued by a certain date. There was considerable resistance for a time, but finally a private company was formed and a system of sewerage laid which gives an outlet to all the thickly-settled portion of town. The system is incomplete, and needs extension farther down the brook as the quantity of sewage increases; but it is an improvement on the old order, and is the foundation for a complete system in the future.

We have adopted the plan of an inspection of the whole town by the Sanitary Committee twice a year. Their report is given to the Inspector, who sends to each party entitled to it a circular filled out to suit each case. If, after a week or ten days, no attention is paid to our suggestions, we send the usual order for the abatement of a nuisance within a specified time, under penalty. We adopt this plan because it is more agreeable to suggest than command, and in most cases is efficient, besides conserving good feeling. Of course this applies to minor nuisances of a private character.

We have had no cases of contagious diseases during the past year. La grippe was prevalent during the winter, but in a milder form than previously. During the summer our town, in common with the surrounding country, was visited with a peculiar epidemic. Most cases began with chilliness, slight elevation of temperature, malaise, &c., but the characteristic symptom was an intercostal neuralgia, remittent or irregularly intermittent, lasting from four to eight days. It was regarded by most physicians as a neurotic type of la grippe.

F. P. McKinstry, M.D.,
Inspector.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter Weller, New Hampton; Wm. Miller, Assessor, New Hampton; Geo. Wyckoff, Port Colden; Geo. Rush, Washington. C. B. Smith, M.D., Health Inspector.

Washington borough, in Washington township, has a separate Health Board.

Water-supply is from springs, wells and cisterns.

Houses usually have cellars, which are largely used during winter for storage of vegetables.

Have had no prevalent diseases this year, except la grippe during winter.

Our drainage is carried away by Pohatcong, Shabbecong and Musconetcong streams.

Refuse and excreta are managed as in all townships—thrown in privy-vaults, of which there has been no complaint during year.

Schools have been unusually free from all epidemics.

Cemeteries are all in good condition.

Public health has been unusually good during year.

Vaccination is not looked after as carefully as it should be; there are many children throughout the township who have not been vaccinated.

La grippe has been the most prevalent; there have been a large number of cases.

SANITARY REPORT AS TO RUSSIAN-HEBREW COLONIES IN NEW JERSEY.

BY LEO F. ELSTEIN, M.D., MILLVILLE.

PREFATORY NOTE BY THE SECRETARY.

Immediately upon the arrival of a cholera ship at the port of New York, letters from South Jersey began to reach us as to the Russian colonies in that section, and as to the frequent arrivals thereto of immigrants or of those who but a very short time had been in the larger cities. A visit of a State Inspector soon satisfied us that the anxiety was well grounded. We were fortunate in securing the additional aid of a Russian physician as temporary Inspector, as also that of Local Boards of Health, in co-operating with the inquiry. The report is so important that we append it nearly in full. It especially illustrates three things—first, how small communities of foreigners are here and there springing up which fully retain the filthy conditions which poverty has thrust upon them in other lands, and which, by their necessary intercourse with surrounding communities, are a menace to public health. This is not only true as to several rural colonies we can name, but of foreign quarters that exist in several of our larger cities, in which those of some one nationality are crowded together, too often in squalid and diseased conditions.

Next it shows how Local Boards may not give to these, their share of sanitary attention. For instance, one of these Boards, which had an Inspector and was looking after the general condition of the township, at once confessed its neglect of such settlements, and almost its fear lest interference with their habits and customs might lead to local disorder. The time has come when all such settlements in the country, and close quarters in cities, must be dealt with in a most helpful way, and with the stern rigidness of law if necessary.

While the foreigner who can become a good citizen is always welcome, we must ever guard against importing disease, or those modes of life which are sure to foster it.

Third, there is especial need for attention to this matter in New Jersey. The colony development, and especially that of Russian Hebrews, has taken on a fixed character, and is likely to become the nucleus of other colonization. It must be guarded in its very start. One of the worst features is that here and there large city firms are making some factory or industry a center around which those of certain trades and nationalties congregate. Too often it results in oppression of labor, or what is practically a sweating system. We beg our Local Boards, whether in city or country, to give the sharpest attention to all these centers of foreign and clannish populations. No one deserves the name of Health Inspector in a township or city who is not able rigidly to cleanse such localities, and if need be to exercise the powers of fine and of cleansing of premises which our law fully secures. With this introduction, we give the report as before alluded to.

To the State Board of Health, Mr. E. M. Hunt, M.D., Secretary:

I beg herewith respectfully to submit the following report on the sanitary condition of the Russo-Jewish exile colonies in the southern part of our State:

Following out your instructions, I started Saturday, the 24th inst., on a tour of inspection through these settlements, reaching Carmel, one of them, at 10 o'clock the same morning.

There are *ten* Jewish colonies in the southern part of the State, scattered irregularly over many counties, and entirely independent of one another, as far as administration or municipal government is concerned. Some are, as colonies, in point of population, intelligence and material progress, quite important; some again insignificant. Four of these, Carmel, Alliance, Rosenhayn and Woodbine, were founded by Jewish philanthropists, with a view of creating an outlet for the overcrowded Jewish tenement-houses in the big cities; the other six colonies are simply the result of private land speculators, who, in most cases, buy worthless bush and swamp-land in some out-of-the-way county, divide it up in lots and imaginary town-plots, and send out unscrupulous agents to our various ports, who, after some manipulating and smooth talk, generally succeed in dragging in with their nets, a few "green" immigrants, to whom, under promises of peaceful homes and permanent employment, at high wages, these lots are disposed of on installments at extravagant prices.

Of the colonies which owe their origin to philanthropy, three, Carmel, Rosenhayn and Alliance, were founded in the year 1882; one, Woodbine, Baron de Hirsch's colony, a year ago. These have all a solid foundation and have attained permanency. The rest of them sprang up at various periods of time within the last two years, are still in a formative state and may just as quickly vanish. But what is of especial interest to your Board, is the one fact that *all* of these colonies, whether founded in 1882 or six months ago; whether well populated and prosperous (Carmel, Rosenhayn, Alliance and Woodbine), or yet a wilderness, inhabited by but one solitary Jewish family (Reeya); whether possessing, in a certain way, an intelligent and progressive popular element (Carmel), or consisting throughout of ignorant, retrogressing, religious fanatics, they are all in a filthy condition, dangerous to the health and lives of the poor exiles living there. It is from this point of view, also of personal uncleanliness, that even the smallest of these settlements may in times of threatened epidemic, and by reason of its constant inter-communication with the most backward country in Europe, viz., Russia, readily become the starting point of infection and contagion in the neighborhood where it is located, and for this reason even the smallest of these colonies must be considered of importance.

Bearing this in mind, I determined to visit as many of these settlements as the time allotted to me (one week) would allow, irrespective of their relative size and importance. This I have faithfully carried out, and am now in a position to give you a complete, accurate and in every way authentic report.

Since these colonies are scattered, and in order to convey to you a clear idea of their relative position to the surrounding country as well as to one another, I shall have to ask you to kindly place a map of southern New Jersey before you, and draw the following two imaginary triangles—one within the other—the larger one of which will include *all* the colonies, the smaller one the three oldest and best known, as Carmel, Alliance and Rosenhayn. The larger triangle has the following points: Bridgeton, Malaga, Mays Landing; the smaller, Bridgeton, Vineland and Millville. I made the smaller triangle my *first* base of operations, going over it *twice*, once alone and once in company with the Deerfield Township Board of Health. The rest of my time was spent in crossing and re-crossing in my own buggy, which, on account of the infrequency of running trains, I preferred to the railroad.

WORK DONE IN THE COLONIES IN DETAIL.

I. Carmel.

HISTORY, CLIMATE AND SOIL.

This colony I consider, in point of intelligence and general education, the foremost among her sister colonies, not only in our own State, but even on our great and wide continent. It contains a goodly number of college-bred men, who naturally impart their personality to communal affairs. An instance of this is the co-operative factory, where all of its workmen possess equal shares, and is managed by a board of managers elected by themselves and from their own ranks. This factory supplies steady work to about two-thirds of the entire working population. The rest of the workmen, not belonging to the "co-operation," find employment in private shops, run by private contractors, or "sweaters," as the co-operative men dub them. This is *not* an *agricultural* colony, since out of a total of 2,400 acres it embraces, only about 150 acres are under actual cultivation; out of an entire population of 200 families, not more than ten make a living by tilling the soil. The rest of the population are factory hands, either at the larger co-operative factory, at the contractor-shops, or in their own homes.

Carmel has no railways, is located in Cumberland county, 6¼ miles east of Bridgeton, 5 miles north of Millville and 2¾ miles south of Rosenhayn. Its soil is dry and sandy, like all the soil of southern New Jersey, if it is not a swamp. The climate is very variable. The whole surrounding country, however, is one continuous marsh or swamp, giving rise at night to heavy mists, oftentimes enveloping the whole place as if with a shroud. The atmosphere is generally overladen with electricity.

This colony, which now, after a ten-years' existence, numbers 155 houses and about 750 souls, was started in the year 1882 by the late scholar-philanthropist, Michael Heilprin, of New York City, father of Professor Heilprin, of Arctic fame. He originally settled here seventeen families, which for years were partly supported by voluntary contributions from himself and some of his wealthy co-religionists. The place has grown by the influx of newcomers from Russia and from our large American cities, and is now a respected and self-supporting community.

SANITARY CONDITION AND APPEARANCE.

Carmel consists of one long, wide, dusty, unpaved street (about 1½ miles), running east and west, bisected by several smaller streets or lanes at right angles. The houses are nice, neat-looking two-story frame structures, showily painted on the outside, and contain, besides a cellar, about seven rooms.

Although many of the houses are occupied by two families, the people are not overcrowded, and might be even comfortable in them had they but the inclination to make them so. Unfortunately this is not the case. The interior of the dwellings, in point of appearance and cleanliness, contrasts sadly with the exterior. Most of them —there are a few exceptions—from the kitchen to the parlor and from the cellar to the garret, are literally covered with all manner of dirt and uncleanliness. There seems to be an utter lack of, and disregard for, the A B C of hygienic rules. The water-supply of the entire colony for culinary, drinking and other purposes is derived from wells situated in the rear yard, close to the kitchen as well as to the privy, which is generally only a few feet (25 to 40) back of it. The well is covered with rough boards, a sort of platform, on which the people stand while pumping the water; and since there are no sinks or waste-pipes on the premises, the rinsing of dirty kitchen utensils, washing of soiled linen and all other personal and impersonal purifications take place around the well and on that platform. Through lack of drainage all the liquid nastiness and impurities spilled upon the grounds very readily ooze their way back to the well through the loose-fitting boards of the platform, as well as through the very porous sandy soil of southern New Jersey. Hence the brackishness and unpleasant taste of the water in most of the houses. The privy-vaults are simply shallow, primitive-looking holes dug in the ground, without any screen from behind, and as they are never emptied, and no disinfectahts used, the nauseating and pestilential odor emanating from them, and which the slightest breeze scatters over the whole place, can better be imagined than described.

The back yards of the houses, also, from want of drainage, are almost invariably covered with from one to two cesspools and mud-holes "for ducks," covered with a greenish scum.

LOCAL BOARDS OF HEALTH.

Here, as elsewhere in the Russian colonies that I visited, there is no trace of the existence or presence of Local Boards of Health to be found. Practically, there are none; and if these immigrants lived in some obscure Siberian village they could not be less under their influence. Since these colonies, even the older ones, have been in existence, no *inspection* has been undertaken to any of them; and quite *naive* indeed sounded the remark of a member of the Deerfield Township Board, in whose borders

Carmel and Rosenhayn are located, that he "had not been to Carmel in five years, and that he had not seen so much dirt in all his life as I had pointed out to him on this single visit of inspection through Carmel and Rosenhayn." Imagine such a dangerous amount of filth and contagion at their very doors, and they in blissful ignorance of the fact!

To the credit of the Board, however, be it recorded, that as soon as I drew their attention to it, they showed themselves perfectly willing to heartily co-operate with your representative in eradicating the evil, and to make amends for past neglect. They consequently met me last Friday morning at Rosenhayn—the entire Board being present—where I conducted them over the ground gone over previously by myself, and an almost house-to-house inspection took place. The work done was thorough and minute. Dwellings, cellars, wells, barns, yards, privies, butcher-shops, factories, synagogues, school-houses and streets were carefully inspected, and the result was—"a great surprise" to them. In the afternoon of the same day all of us drove over to Rosenhayn, going over the same ground there with the same result. The Board subsequently held a meeting at the latter place, where it was resolved to constitute a permanent committee of inspection, which should attend to these places once a week, and also to request the State Board to supply them with 500 notices and circulars printed in the vernacular of these immigrants (Hebrew jargon) for general use and distribution.

The street, or rather streets, if we choose to include the narrow lanes, are exceedingly unclean, never swept, and full of stagnant pools.

PREVALENT DISEASES.

This place is visited by all the eruptive diseases (except small-pox) and continued fevers (except diphtheria) to which overcrowded cities are generally liable. Last winter there was an outbreak of scarlatina (of an endemic nature), and as no precautions were used either during or after its sway, and no houses or articles disinfected, a recurrence may reasonably be looked for next summer.

These people are particularly susceptible to tuberculosis in all its various pathological forms. Sore eyes, affections of the scalp and hair, and a variety of skin troubles, are very plentiful among the children, mostly due to uncleanliness. Cholera infantum and gastric disturbances seem to be their especial enemies. Malaria (of a remittent type) occasionally makes its appearance in the spring and autumn of the year, but it is not obstinate, and yields readily to proper treatment. Syphilis, venereal and other genito-urinary diseases are of extremely rare occurrence in this place, almost unknown, probably due, on one hand, to the early marriages among the Hebrews, not only in this colony, but everywhere in Russia, and, on the other, to the model chastity and purity of Jewish home-life.

The men are very temperate, and drunkenness or alcoholic excesses of any kind are absolutely unknown here. Not only are there no *drunkards* in Carmel, but an intoxicated person would be an amusing curiosity.

II. ROSENHAYN.

HISTORY, CLIMATE AND SOIL.

In the year 1882 the same committee of rich Hebrews of New York City who had charge of the establishing of Alliance, settled six Jewish families in this place, which then was a mere wilderness, consisting of one or two houses. It has now grown, by the same process as Carmel and Alliance, to quite considerable proportions and has become a formidable rival of the former.

In number of houses and population it is somewhat behind Carmel, but it is a much prettier place, has no swamps, is more salubrious, and has in addition, railroad, telegraph, express and telephone offices. It is midway (five miles) between Bridgeton and Vineland, on the Central railroad, and about two and three-fourth miles of Carmel. In point of intelligence, however, it is behind Carmel, as are all the other colonies.

Like Carmel, but much broader, it consists of one wide, beautiful street, about one mile long, with fine sidewalks and trees and also a few cross-streets. The main street runs north and south. Rosenhayn has 150 houses, about 165 families and from 550 to 600 souls. There are seven factories here; one in stage of completion and one not running, so that only five supply work to the people. Of these, one is a button (pearl) factory, one a stocking and the rest sewing. With the exception of this button factory in Rosenhayn, all the factories in the ten Jewish colonies in southern New Jersey, are sewing factories, or, more properly speaking, shops. The big factory in Carmel is also of the same class. Henceforth, whenever I speak of a factory in this report, you will please understand it to mean a *sewing* factory or shop, unless otherwise designated. In these factories are produced, shirts, ladies' wrappers, cloaks and a variety of white goods. Most of the colonies contain, besides their regular factories or shops, which are run by steam, also a number of private shops, run by private contractors for some large city firms. The class of goods produced here is the same as that in the regular shops. In this connection, let me mention that the wages paid for work in all these colonies are far below the average scale of wages paid in cities; that the work supplied, except at the co-operative factory at Carmel, is extremely unsteady; that the people are frequently idle for weeks at a time; that the pay-days are very irregular, the employers being often in arrears with their pay five and six weeks, and that the credit system and consequent overcharging for the necessaries of life (groceries, meat, bread, &c.) are per force in vogue. All these facts drive the colonists deeply into debt, and leave them in a material sense very much behind and impoverished. This state of affairs has been in existence in Rosenhayn ever since its early history.

This colony may fitly be divided into two distinct and separate parts—(*a*) the town of Rosenhayn, consisting exclusively of factory hands, who mostly own the houses they live in and one or two lots in addition (50 by 190), and (*b*) the farmer colony, which is outside of Rosenhayn. This class of colonists devote themselves to farming almost entirely, taking in sewing only during the winter months. Of the 1,900 acres of land that the colony embraces, about one-fifth of it is under full cultivation.

SANITARY CONDITION.

The sanitary condition of Rosenhayn is even worse than that of Carmel. The same trouble with the water-supply, the same lack of drainage, the same entire absence of disinfectants and cleanliness, the same cesspools, mud-holes and stagnant water in the rear yards, the same proximity of privies to wells and houses, the same filth in the dwellings and dirt on the person—in short, whatever I said in this regard of Carmel, holds good in a more intensified degree of Rosenhayn.

The privies of the synagogue were in a horrible condition. It is hard to understand how human beings, possessing olefactory nerves, could ever stand it. The same with several steam factories. Two small wooden boxes ("water-closets"), hardly big enough for an ordinary-sized person to stand up in, served for the use of about one hundred men and women. The factory grounds were thickly strewn with heaps of dirt and old rotten rags, dumped from the workshops and allowed to accumulate there forever.

The inside of the factories and shops was no better—the same rags, the same dirt, and dust and filth on floors and stairs; and, as most of the windows are closed on cool days, the air, overladen with fine particles of dyed-stuffs, is literally suffocating.

The factories of Michael Joseph and Philipowich & Co. were especially bad. Wagon-loads of filthy rags were lying in different stages of decomposition around the premises, and the stench from the privies was unbearable.

AN ATTEMPT AT VOLUNTARY SANITARY INSPECTION BY THE CITIZENS.

Whether due to the cholera scare or to a *bona fide* endeavor on the part of some of the citizens to have their places clean, an actual attempt was made, a few days previous to my inspection here, at sanitary inspection by a local committee of residents of this place. However, nothing came out of it, and, as I am told, for lack of legal authority on the part of that committee.

III. Alliance.

HISTORY, CLIMATE AND SOIL.

Alliance, which is also known to outsiders as "Vineland colony," probably from its proximity to it, as well as from the fact that the latter place is its nearest marketing point, is an *agricultural* colony in the truest sense of the word. Out of a total area of 1,500 acres, about 1,400 are cleared and in full cultivation; and out of a total of seventy-five families, about seventy are engaged in actual farming.

Whenever and wherever you speak with a Jew in this country about the question as to whether "Jews can be farmers," he will point with pride to Alliance as a practical, affirmative solution of your question; and, from an *agricultural* point of view, Hebrews anywhere may be proud indeed of this colony.

In 1881 and 1882, when the first anti-semitic wave of religious persecution swept the Czar's dominions as if with a fury, and landed thousands of unfortunate Hebrew exiles on our American shores penniless and in a condition of abject misery, the big, warm American heart, which is always in the right place, whether it beats in Jew or Christian, warmed up towards them and tried to create a hearth and a home for these shelterless fugitives. Hence the origin of these colonies founded in that year in our State.

Alliance was the *first* Hebrew colony established, not only in New Jersey, but on the American continent. Fourteen hundred acres of bushy, sandy wilderness were bought in Salem county, about five miles east of Vineland and close to Bradway station. This land was divided into fifteen-acre tracts (the future farms), a rough, oblong, cheap, barrack-like structure put up for the accommodation of about forty of the pioneer embryo-farmers, and the work begun. On the front line of the fifteen-acre tracts, small two-story frame houses were erected, and the whole thing, land and house, was given to the farmers for the nominal sum of $150, to be paid in thirty years, $5 annually.

All of that 1,400-acre tract is now transformed into flourishing, well-cultivated, valuable farms (worth over $100 an acre), and the fugitives of 1881–82 are now well-to-do southern New Jersey land-owners and citizens, under the protection of the outstretched wings of the emblem of our great republic, nevermore to be molested by the Russian bear.

There are *no streets*, in the real sense of the word, in Alliance. There are only farms, situated at a considerable distance from one another. The soil is very dry and sandy, excellent for the production of berries, wine, sweet potatoes and fruit.

Alliance has, as aforesaid, about 75 permanent resident families (farmers), and about 350 to 400 population. In summer the population is greater still. The disproportion between the number of families and the entire population is to be explained by the fact that this colony is the "Long Branch," the rendezvous of the poor Jews of our big cities—New York, Philadelphia and even Baltimore. The men stay behind to work and send their families for the summer to this place. There is also an influx of an extra force of people in the "berry-time," who come here to do the picking.

There are *no* steam factories in this colony. Two contractors supply the farmers in winter-time with sewing.

SANITARY CONDITION.

By reason of the fact that the houses in Alliance are considerably apart from one another, as well as that the colonists follow almost exclusively the wholesome, healthful pursuit of farming, attendant with its continual open-air exercise, one would naturally expect the health of these people to be excellent and sickness a rarity. But this is true in a small measure only. It may sound *paradoxical*, but it is nevertheless a fact, that whilst the sanitary condition (in its technical meaning) of Alliance is far better than that of the rest of the colonies (Woodbine excepted), its number of deaths for the one year, 1891–92, exceeded that of all the other colonies. An epidemic of (first) scarlatina and (second) diphtheria struck it in the fall of last year, and it raged with such malignancy that about 85 per cent. of the little patients afflicted were carried off. The same epidemic spread to its two neighboring sister colonies (Rosenhayn and Carmel), and, strange to say, whilst diphtheria got no foothold at all, only about 10 per cent. of the children died from scarlatina.

This I explain in the following way: Whilst Alliance has the advantage over the two other colonies by the healthful pursuit of its people and the distance existing between the dwellings, it is far more backward in every other respect. In point of intelligence, general habits of *cleanliness of person*, food, clothes, dwellings, ablutions and popular education, it falls short of them. And this means a good deal. In fact, the colonists *themselves* are the dirtiest, most ignorant and most beggarly lot of men I ever set my eyes on. This is said in fairness and with full deliberation.

The persons, dwellings, wearing apparel, wells, privies, butcher shops, grocery stores and even many of the articles of food are very filthy.

On the main road leading through the colony, on a little hill, there still stands the "Castle Garden" spoken of above. It still serves, although in a terribly dilapidated condition, as a shelter for new arrivals. Last winter there lived under its tottering roof about twenty-five families. It was reeking with filth and contagion, and it was here that scarlatina and diphtheria had their feasts.

I would strongly recommend your honorable Board to find some means to have this death-trap razed to the ground.

There is another dangerous nuisance here to which I would respectfully draw your attention. It is the slaughter-house situated on Garden road, a street in Alliance.

This slaughter-house is in the midst of a populated section and a constant menace to the health of the community.

Since *none* of the dwellings, school-houses or any other places where scarlet fever and diphtheria existed were afterward cleaned or disinfected, and since the people are so very ignorant, filthy and careless, a repetition of last winter's ravages may be looked for.

IV. WOODBINE.

HISTORY, CLIMATE AND SOIL.

Woodbine, up to exactly a year ago, was an obscure, unknown, insignificant little flag-station on the West Jersey railroad, Cape May division, about twenty-five miles from the latter place. Baron de Hirsch's millions have within the short span of twelve months transformed it into a household word all over the civilized world; and no wonder—there are 10,000,000 francs back of it.

About fifteen months ago Baron Hirsch, of Paris, both the Crœsus and Moses of his people, and who for a year previous to that gave the sum of $10,000 monthly to a New York committee of wealthy Hebrews for the purpose of helping his unfortunate Russian brethren to establish themselves on their arrival in this country, finally donated the enormous fortune of 10,000,000 francs (over $2,000,000) as a permanent trust fund, to be used for the same purpose. The committee then became incorporated under the name of "Baron de Hirsch Fund" and organized on a permanent basis. The first official act of the trustees of the Hirsch Fund was to buy a large tract of good, arable bush-land in Cape May county, consisting of 5,000 acres. They mapped off a piece about a mile square, around the railroad track and parallel to it, for a town site, and laid out a portion of the other land in fifteen-acre farms, after the manner of Alliance, with the difference that they kept fifteen acres more in reserve adjoining the original farms, in case the future farmers should wish to enlarge their field of activity.

When you alight from the train at Woodbine, looking in the direction you traveled, a fine, imposing-looking, broad, two-story structure, with tall chimneys and a sort of tower, to the left of you, and a number of new, freshly-painted, gay-looking cottages to the right of you, will meet your eye. The first is the steam factory (sewing) of Tonasson & Co., of New York, the largest cloak manufacturers in this country; the other is the "town." Right close to the depot and almost across from it, you see a big flag floating from a temporary pole on the roof of an unfinished, fine-looking building, with galleries and bay-windows. This is the "Woodbine Hotel," in process of construction.

The town proper consists of about forty new houses, with nice, freshly laid-out streets and sidwalks, lined by young trees. The farms are scattered irregularly over several thousand acres of land, extending up to Dennisville (about three miles), the marketing place of the colony.

The houses on the farms are two-storied and consist of four rooms, costing the company about $550 each.

Thus far, sixty farms have been apportioned to as many families, who have already cleared about 600 acres of land. Woodbine, including the town, has about 100 houses and an entire population of about 300. The farms are known by numbers, as for instance, Farm No. 1, 15, &c.; but since there are here farms bearing numbers *over 100*, and there are *only* sixty of them altogether in the place, the ingenious inventor of this system of notation must have made a system of numerical progression not known on this planet.

The entire population, farmers included, are employed in the one factory in the place, spoken of above. Of course, the *ground* yields *nothing as yet*, and the farmers have to look for an outside source of support.

SANITARY CONDITION.

The sanitary condition of Woodbine is, as far as it goes, good, making allowances for the fact that the place is very young, has millions of dollars back of it, and is under constant supervision of the Hirsch Fund. Still, the same lack of drainage found in the other less fortunate colonies, exists here in the same degree. The dwellings seem a little cleaner than at Alliance and Rosenhayn, but it would be almost a hard task to tell the difference. The personal appearance of the people themselves, in point of cleanliness and attire, is the best of all the colonies, as behooves the protégés of a baron.

The grocery-stores, butcher shops, boarding-houses for the masons, carpenters and other workmen temporarily employed in the place, and even the grounds of the colony manager's office, leave considerable room for improvement.

The colonists are shamefully at the mercy of the factory people, who pay them starvation wages.

THE COLONIES FOUNDED BY LAND SPECULATORS FOR MONEY-MAKING PURPOSES.

I have thus far described the colonies that were conceived in charity and founded by philanthropy. Bad as their sanitary condition is, they have at least accomplished their mission. They created homes and hearths for many unfortunates. But not so with the other six colonies about to be described. Like birds of prey, the agents of these land concerns seized upon the "green," inexperienced new-arrivals and dragged them to living graves in bushy wildernesses.

There are six of these settlements altogether in the southern part of New Jersey. Here are their names, some of them biblical:

1. Mizpah.
2. Ziontown.
3. Hebron.
4. Malaga.
5. Reega (capital of Finland, Russia).
6. Albertown (Alberton).

V. MIZPAH.

HISTORY, CLIMATE AND SOIL.

About a year ago a firm of cloak manufacturers of New York City bought in Atlantic county, on the railroad track, and six miles this side of Mays Landing, 8,000 acres of wild pine and oak-land, which they incorporated under the captivating title of "Mizpah Agricultural and Industrial Company," built one factory and a few small frame houses on it and offered "town lots" for sale at $75 per lot.

As the allurements were quite enticing, many "greenhorns," as these land companies style them, invested in these worthless lots, with the expectation of finding steady employment in the factory; removed there, with the result that they now "know better," but can't get away for lack of funds. This self-same process you will find repeating itself in all the other settlements of this class.

Mizpah lies south of the station by that name. It was built about four months ago and is simply a flag-station. It is situated on somewhat elevated ground and consists of one factory, thirteen houses, thirty Jewish families and about one hundred souls.

From June to September the factory did not run and the people were almost starving. There are now about sixty machines in operation and about seventy people at work.

SANITARY CONDITION.

The sanitary condition of this place is the worst imaginable. It fully equals the condition found in overcrowded tenement-houses in New York City. Kindly examine the figures: Thirty families, about one hundred souls, *thirteen* houses. And if you bear in mind that these houses have four small rooms only; that a great many of these rooms are still unfinished, without flooring and plastering, and consequently unfit to be used; the further fact that cooking, washing and baking have also to be done for the inmates, and you may imagine how one hundred persons do live in thirteen houses.

As a matter of fact, from four to five people sleep in one of these small rooms. In one instance, that of a shoemaker, he, his wife, four children and *two boarders* occupied but *one* upper room and the *cellar*. Another instance is that of an old man (now removed to Philadelphia) who had sore eyes and had to live in an unplastered cellar, without flooring and full of smoke. It nearly killed him.

It is true some of the people live at Richland, a nice little American settlement, one station this side of Mizpah and a mile from it, but how many? The manager of the colony and one other family.

Many of the houses have neither water nor privies on the premises, and those that have never clean or disinfect them.

The climate is good, but the soil there is no way of tilling, since out of the 8,000 acres *not* a *single* acre is under cultivation.

VI. Reega.

This settlement is at present the smallest *Jewish* colony in America, being inhabited by but *one* solitary family of that faith.

Like Mizpah, from which it is eleven miles distant, it lies on the road to Atlantic City, being the third station this side of it, between Mays Landing and McKee City.

It is owned by the "Atlantic Land and Improvement Company," a Philadelphia firm, composed of a picture frame manufacturer and a wholesale liquor dealer, which bought many thousand acres of bushes here and is selling "town lots." It consists of one small sewing shop, without water or steam, and consequently not running; six small wooden houses, seven families, two Italian, *one Jewish*, the rest Poles, and one small grocery store.

The place is surrounded by swamps, and is at night-time very foggy. Two months ago there lived at Reega about twenty *Jewish* families, working in the shop, but owing to mismanagement and ill-use on the part of the company, they all left, with the exception of this one family, which simply did not have the necessary means to remove. I am informed the company has now engaged a new set of agents in the big cities, with a view of recruiting.

SANITARY CONDITION.

There is very little to be said under this head. The few families starving here are certainly not over clean, and if this place ever starts up again they ought to be looked after in a sanitary sense.

VII. MALAGA.

This is *not* a Jewish colony, but an old, well-known American settlement of several hundred families, mostly employed in the glassworks there. It lies on the route to Atlantic City, and one station this side of Newfield.

There is also a stocking factory here, owned by an American, a Mr. Richman, which gives employment to six Jewish families. All of these families live in a row of small, tumble-down wooden cottages—"Pigeon Row" they call it—with dirty walls and floors, and which, in my opinion, are unfit for human habitation. There is not to the whole row, which consists of about ten houses, a *single well* or any other supply of water. The inside of these "pigeon-holes," as well as their yards, are literally reeking with filth, dust and contagion. There are large heaps of all sorts of rubbish around the premises of every one of them. The privies used by these people are in point of cleanliness beneath criticism.

The worst feature of it all is the fact that all these families, without exception, get their water-supply from an old dilapidated-looking well standing in the middle of the street, opposite the row and about 100 feet from it. The platform of the well consists of loose worm-eaten boards, with big leaks between them, and through which the refuse of half a dozen separate households oozes directly into it. The water, which I tasted, has a nauseating, musty taste, which lingered in my mouth hours afterward. It has worms in it. I mentioned this fact to the owner of both the stocking factory and "Pigeon Row." He simply shrugged his shoulders, remarking, "If these Jews don't like it they can move."

Malaga is situated in Franklin township, Gloucester county.

VIII. ZIONTOWN.

This place, which lies off the railroad about four miles east of Malaga, is a good type of the "colonies" produced within the last twelve months by these land concerns.

Do not let the name mislead you—it is far from being what its namesake was for centuries to the ancestors of these poor Russian victims inhabiting this new Zion.

Its existence is of but one year. Last summer a cloak manufacturer of New York and a man of all trades of Philadelphia, acquired 1,137 acres of bush-land in Gloucester county, near Malaga, and constituted themselves into "The Malaga and Gloucester Land and Improvement Company."

The old, old story now repeats itself. A small sewing shop was built, "town lots" sold at high prices, steady work promised, with the result that about thirty Jewish families were slowly and gradually gathered in. For a few months the company, by way of advertisement, supplied these people with work, and then, when it got all the money it could out of them, the factory stopped working, and the people within a short time were brought to the verge of starvation.

Only recently, within a few weeks, the public press of the country was full of reports of the terrible suffering and privations of the Ziontown people. Some papers claimed that many families for weeks subsisted on "green apples and bad water."

The place now has eight houses, besides the factory, about twenty families and a population of about seventy-five persons.

It is prettily located on elevated ground, and would make a pretty settlement if built up and the people supplied with work.

SANITARY CONDITION.

This is very bad. Out of the eight houses, not more than one-half of them have either water or privies. The rest get their water-supply from the factory pump, which is only about fifty feet from the privy, used by nearly the entire population. The terrible odor this privy spreads over the entire settlement is complained of by all the colonists.

Not a single acre of land is under cultivation.

IX. ALBERTON.

The "Cumberland Land and Improvement Company," happily now defunct, but which they are trying to resuscitate, is another would-be "benefactor" of the poor Jewish immigrants. This company owns some land at a small railroad station called Alberton, on the Cape May route, one station this side of Woodbine, which it tried to convert into a money-making colony. The firm is composed of a ticket broker, of New York, and his nephew, also of the same place.

Owing to personal complications of its owners, the whole colonization scheme collapsed.

The place is composed of about twelve houses, fifteen families and about fifty-five persons, who at times are employed in the factory or sewing shop, whenever there is work.

The sanitary condition is the same as at Ziontown.

X. HEBRON.

This is "an abortive attempt at founding a colony."

It lies on the New Jersey Southern railroad, near Newfield, in the angle formed by the branches of the Cape May and Atlantic City divisions.

It was started a few months ago by an Alliance colonist, and has at present only two Jewish families, a barn and small sewing shop, and does not call for more special notice.

THE COLONIES GROUPED BY COUNTIES.

Salem county	Alliance.
Cumberland county	Rosenhayn. Carmel. Alberton.
Gloucester county	Malaga. Ziontown.
Atlantic county	Mizpah. Reega. Hebron.
Cape May county	Woodbine.

LEO F. ELSTEIN, B.A., M.D.,
Sanitary Inspector.

ABSTRACTS FROM INSTITUTIONAL INQUIRIES.

BY A. CLARK HUNT, M.D.

During the past year, Circular 78 of questions in small book form was addressed to the various institutions in this State, and in nearly every instance prompt return was made, so that there is on file, at this office, a complete statement as to the sanitary condition of each institution. The questions contained in the circular which was sent out will be found under "Circulars and Laws" of this report. In so far as other duties permitted, visits have been made to the various institutions and suggestions given as to needed changes. As some of the circulars and replies were returned early in the year, the statement, as to the number of inmates differs from the present number, but may be taken as an indication of the usual numbers in each of these institutions.

It would almost fill a report to give in full the details as to these institutions. We have therefore chosen the chief points of interest, as to which we make record here:

FARNUM PREPARATORY SCHOOL.

Situated at Beverly. This institution is a day-school, under the charge of the State Board of Education. The water-supply for the institution is received from the city supply, which is taken from the Delaware river. The drainage is taken by a pipe thirty feet from the building and sinks into the sand. Stoves are used for heating, one being placed in each room. As the building is used only as a day-school, there are no arrangements for bath or sleeping-rooms.

NEW JERSEY STATE INSTITUTE FOR FEEBLE-MINDED WOMEN.

Situated at Vineland. There are 50 inmates in all. The water-supply is from the city mains. The cellar is six feet in depth and is very dry. The waste-water is carried to a cesspool, which is 156 feet from the extreme end of the building. The ventilation is by the windows and doors. Strips of wood two inches wide, hinged to sills, on which the lower sash rests, assist in procuring better circulation of air. Regular bathing is in force once each week and oftener if necessary. Each of the inmates is compelled to take a full bath. The report as to this institution is very satisfactory as to the details given.

NEW JERSEY HOME FOR THE EDUCATION OF FEEBLE-MINDED CHILDREN.

Located at Vineland. There are 145 inmates in this institution. The water is taken from six excellent wells, averaging thirty feet in depth, four only of which are used. The cellars and attics in the several cottages are in good condition, and improvements are being constantly made. Each cottage is provided with a separate cesspool, with one exception, and in the one cottage an experiment is being made by carrying the sewage 300 feet away on the surface, where it is disinfected and deodorized and used in connection with plant life. There is no special system of ventilation, but windows, doors and transoms are depended on. Bathing is carefully attended to, all inmates being required to have a full weekly bath unless sick, and the whole matter is under careful supervision. The statement is made that there is constant improvement in all the sanitary arrangements, and that all new work is put in after the most approved method.

NEW JERSEY HOME FOR DISABLED SOLDIERS.

Situated at Kearny. There are 360 inmates. The water-supply is from an artesian well eight inches in diameter and 604 feet in depth, and is pumped by a steam pump. Basements are in some of the buildings used for sitting-rooms, and as the buildings are located on a side hill, are well lighted and dry. The sewage is carried to the main sewer, which discharges into the Passaic river. Ventilators for the house drains are carried to the top of the building. Ventilators are placed in the side walls and ceilings in each of the buildings. The bath-room is in charge of a sergeant of baths, and is open daily from 9 A. M. to 4 P. M. for the use of inmates. There are fixed rules for bathing, but it has not been necessary to enforce them, as most of the inmates voluntarily avail themselves of the facilities offered. In the inspection of this institution, every portion of it was found in admirable condition, with one exception, that exception being the condition of the water-closet placed behind the building. Since the visit was made, this whole matter has been re-arranged, and the institution is now in a good sanitary condition.

NEW JERSEY STATE PRISON.

Located at Trenton. Number of inmates, 989. Water-supply is obtained from two wells, one forty-eight feet deep, located in the yard, and one eighteen feet deep, located in the cellar. The water from these is pumped into east wing and north hall. And city water is also used in addition. The basements are dry, and are used for storing, &c. The sewer-pipes can be flushed at any time, and the main conduit is flushed each week. The main sewer runs through Cass street into the city sewer. The sewer-pipes are ventilated by flues in connection with the chimneys. In the large corridors ventilation is secured by means of large windows, and the cells are ventilated through the doors and by metal pipes extending to the roof. In the north halls, wooden conduits to the roof allow the exit of foul air. In the west wing, registers opening into the chimneys secure the same result, and this method of ventilation is carried out throughout the whole building. Hospital arrangements are provided. A large bath-room has recently been built, having several compartments, and with a cemented floor, well drained. A spray bath through rubber tubes with nozzles is placed in each compartment. Warm and cold water is provided.

The inspection of this institution revealed the fact that there is much need of a change in the plumbing arrangements in the old wing. The system at present used is very crude, and not without danger to the inmates. The soil-pipe in this building is flushed regularly each week, but although each fixture in the various cells is plugged with a wooden plug, there is, nevertheless, exit of foul odors into the cells. The light in the various cells in this portion could also be very much improved.

There is also a lack of the proper room in this institution for the care of the large number of inmates, and although the institution is as well administered as the circumstances will permit, there should be at once an improvement in the matters referred to. This can only be accomplished by the erection of a new wing, to take the place of the old one, or by a thorough taking out of all the old pipes and replacing them with a perfected system. While these matters of structural detail are open to criticism, the institution as to its administration and general condition is to be commended.

STATE REFORM SCHOOL.

Located at Jamesburg. There are 339 inmates in this institution. Total number in the institution during the past year, 548. The water-supply is obtained from a spring, and the water is collected by underdrains from a field to the south of the building. The water is pumped to a stand-pipe 8 feet in diameter and 75 feet high, having a capacity of 27,000 gallons. An analysis of the water, which is given, is very satisfactory. In cases of fire, water is pumped from a pond near by. Each of the buildings is provided with a cellar, and these are all in excellent condition. All the buildings are carefully supplied with arrangements for carrying away soiled liquids, and the sewage is finally emptied, after passing through an open ditch, upon farm-land.

The buildings are ventilated by windows and registers to flues. Buildings are heated by steam radiators. Compulsory bathing each week is in force. Inspection of this institution showed it to be in a very satisfactory condition throughout.

NEW JERSEY SCHOOL FOR DEAF-MUTES.

Located at Trenton. Number of inmates, 127. Water is obtained from the city supply. Basements are used for kitchens, dining-rooms, play-rooms, &c. Basements are frequently washed with whitewash, but a portion of the basement gets very little direct sunlight. There is no ventilation provided for in many of the rooms; where flues exist steam coils have been placed inside of them to make an up draught. Each pupil is required to bathe once in each week under fixed regulations. In warm weather such bathing is required twice each week. The principal defect noticed in the report of this institution is the fact that the ventilation is insufficient.

STATE INDUSTRIAL SCHOOL FOR GIRLS.

Located at Trenton. Number of inmates, 76. Water-supply for drinking purposes is obtained from a well 20 feet deep, located 25 feet from the house. For domestic purposes it is taken from a spring near the pond, which is 6 feet deep and 10 feet wide. The cellar, which is dry, is used for laundry, bakery and other purposes. The soiled liquids are conveyed to a sewer, but this is a recent arrangement. In the old building a ventilator is placed in each room, but in the new building ventilation is provided for by a main shaft in the center of the building. All the buildings are now being provided with steam radiators. All the inmates are compelled to bathe each week, unless prevented by sickness. The report shows that many important changes for the better are being made.

THE NEW JERSEY STATE LUNATIC ASYLUM.

Located at Trenton. Water is obtained for this institution from a spring near the laundry building, with a capacity of 375,000 gallons every twenty-four hours. The basements and cellars under the buildings are well lighted and dry, and are principally used for the heating and ventilating apparatus. The various portions of the institution are provided with sanitary appliances, but on account of the character of the inmates, some forms of fixture, which otherwise could be used, cannot be made available.

The method of heating is by indirect radiation. Fresh air is propelled into the building, and the air is taken from the rooms and also from the soil-pipes by means of exhaust-fans, and removed by a large stack.

The sewage is disposed of in two ways. From some of the buildings it is carried to receptacles in the garden, and there used for fertilizing purposes. From other buildings it is carried down below the slaughter-house, to a point located near the feeder or water-power. It is flushed over a surface at this point, which is inclosed by a retaining wall, which is supposed to allow the filtration of the sewage before it empties into the feeder, but this in reality does not take place, and the sewage may be said to run almost directly into the feeder, which is located but forty-five feet from the wall.

Each patient is required to bathe regularly each week. An examination of this institution, more especially in regard to ventilation and sewage, was in the main satisfactory, but the necessity for the adoption of a thorough system of sewerage is apparent. Although, from time to time, difficulties have arisen in regard to the ventilating system, these have been promptly adjusted. The new building which has been recently erected, is especially well arranged.

STATE ASYLUM FOR THE INSANE.

Located at Morristown. Number of inmates, 927. Water-supply is from springs. Basements and cellars are used for storage, &c., and are in good condition. A separate sewer from each wing carries the sewage from the buildings to a large settling-tank. A full description of this system is given in a former report. Ventilation is secured by means of force-draught and exhaust-fans. Two fans twelve feet in diameter, with a capacity of 8,000,000 cubic feet per hour, force the air into the building, and the consumed air is drawn off through ventilators, and thence to trunks in the cellar. These trunks are connected with stacks running from the cellar up through the roof. Fresh air is delivered to the various radiators in the cellar from the fans through subterranean ducts in the cellar.

Compulsory bathing is enforced. An inspection of this institution found it in good condition, and a number of very satisfactory changes have been made as to the arrangement and location of the piggery, and in other ways; the removal of waste materials has been better provided for; the custom of taking the material from the settling-basin in front of the institution, and spreading it over the fields near by as a fertilizer, has been abandoned and other decided improvements have been made. The report from the institution deals with all matters in full.

ATLANTIC COUNTY ALMS-HOUSE.

Situated at Smith's Landing. Number of inmates, 16. The water-supply is obtained from two wells, one on each side of the house, each of them 24 feet in depth, and the supply is very satisfactory. The cellar is 20x40 feet, and is very dry and well lighted. There are no inside sanitary arrangements; a transom is placed over the door in each room, so as to supply ventilation through the halls, and from the hall a ventilating-shaft runs to the roof. The building is heated by hot-water radiators. No bath-room is provided. An inspection of this institution showed it to be in excellent condition as to cleanliness, but needing very much some provision for bathing.

ATLANTIC COUNTY JAIL.

Situated at Mays Landing. Number of inmates, 10. Water supplied from a driven well 18 feet deep and 8 inches in diameter; the water-supply is satisfactory. The cellar is dry and used for storage purposes. Ventilation is secured by means of the windows, and also by a skylight. The building is heated by steam. The sewage is carried by means of a pipe to the river. This has given some trouble, but the Freeholders have promised to make necessary changes. Outside of a lack of water for washing purposes, due to allowing the tank to become empty, the jail was in fair condition.

BERGEN COUNTY JAIL.

Situated at Hackensack. Number of inmates, 16. Water-supply is obtained from the city supply. The cellar is dry and contains heating and laundry appliances, and has in it several sleeping-rooms. The sewage is emptied into the Hackensack creek, behind the jail. Closets are located in each of the corridors, and a bath-tub is also supplied. There is no compulsory bathing. Ventilation is by means of windows only. Buildings are heated by steam. The sanitary condition of the institution at the time of inspection was satisfactory.

BERGEN COUNTY ALMS-HOUSE.

Located at Oradell. Number of inmates, 26. The water-supply is obtained from three wells 18 feet in depth. The cellar is dry and in good condition. Closet arrangements are outside of the building. The building is heated by stoves. Ventilation is secured in the female department by openings to the roof. The male department, which has heretofore consisted of an old and rather dilapidated building, is to be torn down and a modern wing, similar to that used for the women, is to be erected. Bathing facilities are provided in part. Great care was noticed in this institution in regard to cleanliness and securing of purity of air in the various portions. The system is adopted of compelling all inmates to remain out of their rooms during the day, unless sick. The windows remain open during their absence.

TRI-TOWNSHIP HOUSE.

Located at Englewood. Number of inmates, 4. Water-supply is from wells 40 feet in depth. Cellar is four feet in depth under both buildings. In the new building it is used for storage and furnace; in the dwelling-house the basement is used for a kitchen. All the waste liquids are emptied into a cesspool. The new building has a sanitary closet with automatic flush-tank, and also is provided with bath-tubs. All traps and fixtures are properly ventilated and in good condition. The ventilation in the new building is arranged for by registers in the wall. In the old building, windows are depended upon for this purpose. In the new building, a hot-air furnace supplies the heat, and the old building is heated by stoves. There is an outside building, having in it a bath-tub, which is used for the general bathing of inmates upon admission. The inspection of this building was satisfactory as regards the new portion, but the old building was without cellar, and badly arranged in many ways. We are pleased to notice that in the report on this institution the statement is made that a new building for males will be erected sometime during this year.

BURLINGTON COUNTY JAIL.

Located at Mount Holly. The water-supply is obtained from a well 6 feet in diameter and 30 feet in depth. The cellar is dry, and is used for kitchen, laundry and storage purposes. A number of persons sometimes sleep in the basement. The soiled liquids from the institution are carried by a drain into the Rancocas creek.

Ventilation is secured by means of windows. The buildings are heated by stoves and heaters. There is a bath-room on every tier. The inspection of this building revealed the fact that it is very necessary that there should be some other arrangement made for dealing with tramps. On the third story there were nine occupants and three cells. A bath-tub and closet were located at the end. The closet fixture was in wretched condition. On the second floor, with the same space and the same arrangements, were twenty-nine men, sitting side by side in a row in the corridor on doubled-up mattresses. The closet also in this portion was in bad order, and the room so crowded as to be unbearable. On the female side the conditions were quite favorable, as there were only ten inmates. There is also need of entirely new closet fixtures, and improved bathing facilities. But it is evident that nothing can be done in regard to these matters until the overcrowding is relieved by means of increased provision for the care of tramps.

BURLINGTON COUNTY ALMS-HOUSE.

Located at New Lisbon. Number of inmates, 250, including those in the insane asylum. Water-supply is from two wells near the house, but the main water-supply is from the north branch of the Rancocas creek, and this is pumped by water-power through a six-inch iron pipe into a reservoir with a capacity of 60,000 gallons. The cellar is dry and is used for kitchen and other purposes. There are no inside closet arrangements. Ventilation is secured by means of windows and ventilator over the door. The buildings are heated by three hot-air furnaces and by stoves. Most of the women are bathed with regularity once a week. At the time of the visit to this institution, two things were especially noticeable as needing attention; the first is the supplying of some better method for dealing with waste liquids, as they are now allowed to run through an open drain behind the house; the second is the location of the hospital, which is so far from the main building as to render it difficult to provide a supply of warm food to the sick.

CAMDEN COUNTY ALMS-HOUSE.

Located at Blackwood. Number of inmates, 173. The water-supply is taken from a stream, and there is also a well 16 feet deep located near the barn. The cellar is dry and is used for wash-house, cells, kitchen, pantry, &c. Drains are emptied into a sewer and carried to a creek. There are flues in all of the rooms connected with a stack for the purpose of ventilation, and the buildings are heated by steam. Inmates are compelled to bathe each week. The condition of this building, upon examination, was very good, but it is stated in the report that there is need of more hospital accommodations than at present. There is, in connection with this institution, a hospital which is well arranged and provided with properly-constructed closets and bath-rooms, but the building is not large enough to accommodate many invalids.

CAMDEN COUNTY JAIL.

Located at Camden. Average number of inmates, 100. City water is used, which is obtained from the Delaware river. Basement and cellar are in good condition and used for cooking, heating and other purposes. The jail is provided with a thorough system of ventilation, each cell having its separate ventilator, and all the cells being connected in this way with the central space between the two tiers of cells, and this space connected by a large pipe with the chimney flue. The heating is by means of steam radiators. A bath-room is located in each corridor. There is need in this institution of better provision for the care of the female prisoners than at present. The construction on the male side is satisfactory, but the allowing of the prisoners to keep clothing and other materials in their cells is not conducive to cleanliness. One or two of the bath-rooms are not well arranged as regards lighting. At the time of the inspection the ventilation from the cells was not satisfactory, and distinct odor, due to accumulation of soiled clothing, was noticeable. The lighting of the jail and other particulars were satisfactory, but bathing should be enforced with more regularity.

CAMDEN COUNTY ASYLUM.

Located at Blackwood. Number of inmates, 135. The water-supply is obtained from the South Timber creek, a stream running through the property; the supply is satisfactory, but not abundant. The cellar is dry, and the back part of it is entirely above ground, and is divided into rooms, which are used for turbulent patients. The waste liquids are carried by a sewer to a stream in the rear of the building. The ventilation is secured by flues, which are connected by underground conduits with two heated stacks. The building is heated by steam, both the direct and indirect methods being adopted. Strict rules for bathing each patient in the building once each week are rigidly enforced. An examination of this building, with two exceptions, was eminently satisfactory. The laundry facilities could be very much improved. The present location of the laundry in the front of the building is very unsatisfactory; it would be much better if a separate building could be constructed. The water pressure, especially upon the upper floors, is insufficient, and provision should be made for increasing it. A closet on the third floor, which was located in a dark spot, was at our suggestion changed so that it became a part of an adjoining bath-room. The institution is well conducted, and, aside from the defects mentioned, will bear the closest examination.

CAPE MAY COUNTY ALMS-HOUSE.

Located about a half-mile from Cape May Court House. Number of inmates, 18. The water-supply is from two wells, and there is also a driven well and cistern. The cellar is dry and well lighted, there being a window every six feet. No inside closet arrangements. All soiled water goes through pipes to a running stream. Ventilation is by windows and transoms. Inmates are bathed each week. The inspection of this institution was very satisfactory, as the building is a new one and is well arranged. All the rooms were exceptionally clean. There is a hospital building separate from the main building, and also a separate laundry building. The building is heated by a hot-air furnace.

CAPE MAY COUNTY JAIL.

Located at Cape May Court House. Number of inmates, one. There were forty inmates in all during the past year. Water-supply from a well six feet from the kitchen and fourteen feet in depth. There is no basement or cellar. There is an inside closet arrangement, but no water-flush, and materials empty into a vault beneath the building. Soiled liquids are carried to a cesspool. Ventilators are placed in the rooms, but windows are chiefly depended upon. Heating is by stoves. No facilities for bathing. Under the heading of needed changes, the report states that an entirely new jail is needed.

The inspection of the jail shows that this is an absolute necessity. The present closet arrangements are as crude as possible, and the jail has nothing to commend it for the purpose for which it is used. We hope that the county will provide in the near future for its prisoners, by constructing a modern jail with all needed appliances.

CUMBERLAND COUNTY ALMS-HOUSE.

Located at Bridgeton. Number of inmates, 92. Water obtained from wells 75 feet deep, and it is of excellent quality and very satisfactory. There is a basement, which is dry, and is used principally for heating arrangements and storage. Depend upon windows for ventilation. Heating is by steam. There are bath-tubs on both sides of the house, and there is supervision of the bathing of inmates. There is a separate annex where laundry and other work is done. Inmates are washed in a separate house before they are allowed in the main building. Two large rooms are set apart for hospital purposes. There is a building set apart for insane persons, which is heated by stoves. A person is in charge of this at all times. Sewage is carried by means of open drains to a stream below the main building. The institution was found in an excellent condition as regards cleanliness. With the exception of the advisability of removing a boy from the asylum to some institution better adapted for such cases, no decided changes seemed necessary.

CUMBERLAND COUNTY JAIL.

Located at Bridgeton. Number of inmates, 22. City water is the basis of supply. Ventilation only by windows. The building is heated by steam. Hot and cold water is furnished for bathing, and bathing is required, but no list is kept of baths taken. The jail was found in only fair condition. The sewage is emptied into Cohansey creek. More attention should be given to the details of cleanliness.

ESSEX COUNTY ASYLUM.

Located at Newark. There are 572 patients in this institution. For drinking purposes, water is taken from a driven well 200 feet deep, and the analysis shows it to be a very satisfactory supply. All waste liquids and sewage material empty into the city sewers, and all fixtures are properly trapped and ventilated. Ventilation is by means of registers, which terminate in louvres, and the up-draught is supplemented by the use of steam coils. Every patient is bathed each week unless otherwise ordered by the Medical Superintendent. An inspection of this institution showed it, so far as supervision and cleanliness were concerned, in admirable condition, but there could be an improvement in the character of the closet fixtures, so as to make them in keeping with the other arrangements. There is one hall which is not properly lighted, but this seems unavoidable. There is need also of a more thorough system in case of fire, and additional fire-escapes. The report from this institution is very full and satisfactory, but the suggestion is made that for increased effectiveness in the work a day-school and workshops should be provided for the patients, and that a gymnasium and facilities for Turkish baths would be a decided improvement.

ESSEX COUNTY JAIL.

Located at Newark. Number of inmates, 170. There were in all during the past year 3,591 prisoners. Water-supply same as city. Water is introduced into the cells in the new wing and on the first floor of the old wing. All sewage is carried to the main city sewer, and all fixtures are properly trapped and ventilated. In the old building pails are furnished each cell for use during the night, but in the new wing there is a lavatory and water-closet in each cell. Heating is by steam. Bath-tubs are placed in the different parts of the jail, and bathing is compulsory. At the time of the visit to this institution a new portion of the jail was just being completed, and the examination of it was very satisfactory, but there was some slight overcrowding, due to necessary changes while the new building was in process of erection. Upon the whole the examination was satisfactory.

ESSEX COUNTY PENITENTIARY.

Located at Caldwell. Number of inmates, 250. Water-supply is from a well 20 feet in diameter and 30 feet deep. There are also two other wells, one an ordinary dug well, and the other a driven well 60 feet in depth, which supplement the supply. The basement is dry, but not well lighted, so that the use of gas is necessary. Each cell is provided with a closet, and all fixtures are properly trapped and ventilated. The form of closets used in the cells is the hopper. Sewage is distributed in small sub-surface drains, by what is known as the Waring system. The ventilation in the corridors is by gratings through large ventilators in the roof. The cells are ventilated separately. Heating is by steam. Every one is bathed on admission. At the time of the visit to this institution the bathing facilities were entirely inadequate. The sewage-disposal field was not giving entire satisfaction. The attention of the Board of Freeholders was drawn to these matters and met with immediate response; both defects have since been overcome. As regards cleanliness and system, the institution ranks very highly and will bear the closest examination.

NEWARK CITY ALMS-HOUSE.

Located at Newark. Number of inmates, 154. Water-supply from wells. Heating by steam. Basement dry and well lighted; used for kitchen and other purposes. Buildings well arranged; all closet fixtures properly cared for; all waste liquids are emptied into the sewers. The plumbing of the whole building has been recently examined and needed alterations made. Each inmate is compelled to take a bath each week, and persons are put in charge of the bath-room to see that they bathe thoroughly. The examination of this institution was very satisfactory, and throughout was cleanly and well regulated.

SOUTH ORANGE TOWNSHIP ALMS-HOUSE.

Located near South Orange. Consists of a farm-house, with farm attached, and has but four rooms, which are used for inmates. There are no bathing facilities. Drainage is carried by pipes to a field below the house. There are no indoor closet arrangements. Water is from a dug well and is of good quality. Ventilation is by windows. Heating by stoves. There are seldom over three inmates. The building was well cared for throughout, and the only suggestion made was that the building should be repainted, so as to make it somewhat more attractive in appearance.

ORANGE CITY ALMS-HOUSE.

Located between Orange and Newark. Post-office address, Vailsburg. Number of inmates not given. Basement is dry and well lighted, and is used for storage and heating. Water-supply is from well and two cisterns. Sewage empties into two cesspools in the rear of the building; all fixtures properly trapped and ventilated. Wash-out closets are used throughout the building. The windows are arranged with sashes which can be opened freely for ventilation. Heating is by steam radiators located in the various rooms. Each ward is provided with a bath-tub which is supplied with hot and cold water. There are separate hospital rooms. There is over 3,000 cubic feet of air space per inmate. This institution was built in 1891, and the building was examined before the inmates had been transferred from the old to the new quarters. The arrangement is such that with proper supervision, there is no reason why the institution should not be kept in a sanitary condition. The use of large wards overcomes the tendency that there is, where small rooms are used, to neglect, by reason of the difficulty of passing from one room to another, opening doors and examining corners, &c. Under the present arrangement, by walking through the wards, anything needing attention is immediately brought to the notice of the Superintendent.

BELLEVILLE TOWNSHIP ALMS-HOUSE.

Located one mile from Belleville. Number of inmates, 12. Water-supply from a well and cistern. No indoor closet arrangements. Cellar is dry and used for storage. Wash-water, &c., is carried out and thrown on the surface. Windows are used for ventilation. Heating is by stoves. No bathing facilities. The former visits to this institution had not found it as it should be, but a visit made April 30th showed that there had been a decided improvement in all sanitary matters. There were at that time but five inmates, under the care of an old man. The rooms were clean, the walls freshly white-washed and the floors properly scrubbed. There was one female inmate, whose condition was such as to make it desirable that, if possible, provision should be made so that she could be cared for in an institution affording better facilities. There is need in this institution for the introduction of bathing arrangements.

BLOOMFIELD TOWNSHIP ALMS-HOUSE.

Located near Bloomfield. Number of inmates not given. Heating is by stoves. Water-supply is from a well 25 feet deep. No inside closet arrangements, and no bathing facilities. This institution is merely a small house, which was purchased by the township, and it is seldom filled with inmates. A poor family is sometimes allowed to occupy a room, and then is provided for by help from the town. At the time of the visit it was found in very good condition, having but two occupants.

GLOUCESTER COUNTY ALMS-HOUSE.

Located near Woodbury. Number of inmates, 60. Water-supply is from a spring located about 2,000 feet from the building, and the water is forced to a reservoir on a hill 1,000 feet from the house, having a capacity of 750 barrels. This reservoir is covered and ventilated, and the supply is very satisfactory. There is also a well 30 feet in depth located near the house. Cellar under all the building, which is dry and well lighted. Basement used for kitchen, dining-room and storage. There are indoor water-closets, which are connected with the main pipe-sewer. Laundry is carried on in outside buildings. Hopper closets are used. Ventilation is by windows and transoms. Hot-air furnaces supply heat.

No particular regulation as to bathing, but where needed it is compulsory. The sewage is carried through a main sewer to a stream behind the barn building. A separate building is used for the care of the insane. The construction of the closets in the asylum was crude and unsatisfactory. It would be better if some other arrangement could be made for the care of the insane. Outside of the closet fixtures in the asylum the other buildings were in a very cleanly condition. The attention of the Freeholders was drawn to the matter and immediate action promised.

GLOUCESTER COUNTY JAIL.

Located at Woodbury. Number of inmates, 7. City water is used. There is a bath-room on each side, and a washout closet in each corridor. The jail is heated by steam. Each cell is separately ventilated by small openings, connected with special flues. The examination of the jail showed that the arrangement upon the whole is satisfactory, but the light is insufficient, owing to small windows. Iron-frame bedsteads would be much more satisfactory than the present method of placing the mattresses upon the floor in the cells. A special hospital-room should be provided. These defects were explained to one of the Freeholders, who will report in reference to the action taken.

HUDSON COUNTY ALMS-HOUSE.

Located at Snake Hill. Number of inmates, 672. Cellar is dry and fairly well lighted, and is used for storage purposes. Water-supply is from the Jersey City reservoir. Ventilation is secured by means of windows and an air-shaft extending from the ground floor to the roof. Buildings are heated by steam. The old men's pavilions are heated by stoves. All new-comers are compelled to take a bath, and general bathing is under careful supervision. The main building, upon examination, was found in a very cleanly and well-kept condition, but the present arrangement for dealing with garbage, sweepings, &c., should be replaced by some better appliance. The closet arrangements are in a separate building behind the main building, and thus any contamination of the air in the sleeping apartments is avoided. In addition to this, the old men's pavilions are without proper bathing facilities, and it would be well if these pavilions could be either rebuilt or new ones erected in their stead.

HUDSON COUNTY JAIL.

Located at Jersey City. Ventilation by means of windows. Hopper closets, with flood tanks, are used in various portions of the jail. Fixtures are trapped and vented. Brass buckets are used in the cells. Blankets are disinfected after each inmate leaves, by using superheated steam. Number of prisoners at the time of visit, 218. The cells differ greatly in size in the various wards, but throughout were found in good condition. Many of the cells are provided with a small ventilator, which leads to an open space between the cells. The air of the jail was fairly pure. The flush to the closets on the third floor was insufficient. Soil-pipes are connected with city sewers.

The jail is heated by steam. The chief difficulty encountered in this institution is that it is sometimes overtaxed by reason of too large a number of prisoners, and therefore it is difficult at times to control its sanitary condition.

HUDSON COUNTY LUNATIC ASYLUM.

Located at Snake Hill. Number of inmates, 315. City water is used. Cellar under only one of the buildings. Inside closet arrangements are all connected with the sewer. The different wards are ventilated by flues going to the roof. Buildings are heated by steam. Inmates are bathed once each week. This institution was found in good condition, but very much overcrowded. There is one ward which is especially well located as regards sunlight and ventilation. We were informed by the Superintendent that new buildings are to be erected and the old ones entirely vacated, and the change, when it is made, will be very satisfactory, as the overcrowding is apparent to any one visiting the institution.

HUDSON COUNTY PENITENTIARY.

Located at Snake Hill. Water-supply from Jersey City reservoir. Heating is by steam. Brass buckets are used in the old prison, and in the new, water-closets. Within a short time improved bathing facilities have been furnished, so that each prisoner can be regularly bathed. The inspection of this institution was very satisfactory. Thorough system and discipline are apparent upon every hand. The closest inspection revealed nothing but what was commendatory.

HUNTERDON COUNTY JAIL.

Located at Flemington. Heating is by stoves. The closet arrangements, which were formerly very unsatisfactory, have recently been very much improved. City water is used. In former visits to this institution, defects were commented upon and the committee in charge inspected the jail in company with us, and their attention was drawn to the necessity for better closet arrangements, increased bathing facilities, and of making better provision for the separation of the sexes. A recent statement from one who is interested in this institution, informs us that many desired changes have taken place and that the institution is in very much better condition.

RARITAN TOWNSHIP ALMS-HOUSE.

Located four miles from Flemington. Buildings are of the old farm-house type. Number of inmates, 4. Heated by stoves. Water-supply from wells. The general condition of the whole house is very satisfactory.

MERCER COUNTY JAIL.

Located at Trenton. Number of inmates, 50. Water-supply from city main. Sewage is emptied into the Assanpink creek. Ventilation is by means of windows and by openings through the roof. Heating is by steam. Bathing required once each week. Upon examination the jail was found in a cleanly condition, but with several objectionable features. The old cells in the basement are insufficiently lighted and ventilated. The present closet arrangement in the cells would be much improved if a more modern plan were adopted. The present plan is that of having the fixtures attached to a soil-pipe running horizontally under each fixture. This soil-pipe is kept half filled with water and is flushed out twice a day by opening a valve at the end of the tier. Another difficulty is that in the effort to economize water, the closets are not flushed as thoroughly as they should be. The bathing facilities should be increased.

TRENTON CITY ALMS-HOUSE.

Located at Trenton. Number of inmates, 52. City water is used. Cellar is dry and well lighted, and in it are located the kitchen, dining-rooms and heaters. No inside closet arrangements. Soiled water is carried to streams back of the building. Ventilation is by windows. Building is heated by hot-air heaters, three in number. Each Friday inmates are compelled to bathe. The different parts of the building upon examination were found scrupulously clean. The only improvements necessary are the increasing of the bathing facilities, which necessitates the putting of water on all the floors, and the using of covered pipes for carrying away kitchen waste liquids, instead of the wooden trunk used at present.

MIDDLESEX COUNTY JAIL.

Located at New Brunswick. Number of inmates, 40. Water-supply same as that of the city. The basement is dry and is used for a dungeon, kitchen and heating purposes. Each corridor is provided with closet and bathing facilities. Heating is by means of steam radiators. Ventilation is secured by means of windows and a ventilator in the roof. There is no regular system of compulsory bathing. The jail upon examination was found in a fair condition, but the bath-room and closet in the men's corridor are badly located, being in a room which is insufficiently lighted. The closet fixture itself was out of repair. The new portion of the jail is very well arranged, and the light is excellent. There should be, so the report states, provision made for boys and girls under 14 years of age, in accordance with the law. The light in the old portion of the jail is not as good as it might be, and the cells, which are placed in the cellar, are damp and should not be used.

NEW BRUNSWICK CITY ALMS-HOUSE.

Located at New Brunswick. Number of inmates, 35. Water-supply is from a spring situated 25 feet from the kitchen. Basement is dry and used for storage of milk and vegetables. Waste-water is thrown on the surface of the ground, and there are no inside closet arrangements. No special regularity as regards bathing is enforced. A visit to this institution revealed the fact that although, as regards cleanliness, every effort is made to secure it, yet it is almost impossible, with the present structural defects, to make the institution what it should be. A new building is very much needed, with modern improvements and improved sewerage facilities. Those in charge should at once take into consideration the advisability of providing the necessary appropriation. Much credit is due to those in charge of the institution for its cleanliness under the present conditions.

PERTH AMBOY CITY ALMS-HOUSE.

Situated at Perth Amboy. The building is situated in the northerly portion of the city, in what are known as the Old Barracks. There are no inside closet arrangements, and there is no provision whatever for drainage, slops and other material being thrown upon the ground. There is no cellar under the building. The water-supply is from a well, which is located but 30 feet from the water-closet. At times the water has a bad taste. There is no system of ventilation. Heating is by stoves. There are four inmates. In regard to this institution, we would state that the location is not a good one, that the walls are damp, and the surroundings are bad; that the water-supply is unsatisfactory and probably unsafe; and that, taken altogether, the place is entirely unfit for such an institution. The matron of the institution had evidently made an effort to keep the place cleanly. It is to be hoped that the city will soon erect or rent a more suitable building.

PISCATAWAY TOWNSHIP ALMS-HOUSE.

Located near Stelton. This institution consists of an old farm-house, with an extension for inmates. There are no bathing facilities. The basement and cellar are dry, and the water-supply is obtained from a drilled well 62 feet in depth. There is no special system of ventilation. A small building has been erected recently, to be used as a hospital. There were eight inmates in all. Upon examination, the building was found in excellent condition in every way.

MONMOUTH COUNTY JAIL.

Located at Freehold. Number of inmates, 42. Water-supply is from artesian wells, the same as is used in the city. There is no basement or cellar. Closets are located in the jail, and the soiled liquids are emptied into cesspools. There is no system of ventilation except by windows. In one corner of the men's prison are located the sink, bath-tub and closet. The floor in this locality was foul, and the condition of the closet uncleanly. The allowing the inmates to expectorate on the floor seriously interfered with any effort at cleanliness. The bath-tub is insufficiently supplied with hot water, and there are no rules for bathing. The allowing of tramps to occupy the jail together with other prisoners is not conducive to cleanliness. It is to be hoped that this institution will soon be provided with better facilities for dealing with waste material, and that improved bathing facilities will not only be provided, but regulations as regards bathing rigidly enforced.

MONMOUTH COUNTY ALMS-HOUSE.

Located in Neptune township. Number of inmates, 18. Under the direction of the new Keeper, numerous improvements to this house have been made. The dangerous porch on the north side of the building has been strengthened. The heating is provided for by a hot-air furnace. A new privy system is soon to be arranged for. The general care of the institution and its cleanliness and neatness contrast with its former condition. There is much need of a better water-supply and of better bathing facilities. Some better arrangement should also be made for the separation of the sexes.

MORRIS COUNTY ALMS-HOUSE.

Located near Boonton. Number of inmates, 83. The water-supply is from four wells, one cistern and a stream. There are no inside closet arrangements. All waste liquids go to a brook. Ventilation is only provided for by windows. Buildings are heated by two furnaces and by stoves. Bathing is enforced once each week. Examination of these buildings found them especially lacking in bathing facilities. The men's sleeping-room is the best portion of the building; the part of the institution called the crazy-house is poorly kept and needs an entire change in management. The ventilation was bad throughout this building, and food and rubbish were tucked away on windows, &c. An increased water-supply is very much needed and can be secured with but small outlay. The attention of the Board of Chosen Freeholders was drawn to this at a former time, and it is hoped that the matter will receive attention.

MORRIS COUNTY JAIL.

Located at Morristown. Number of inmates, 20. City water is used. Heating is by steam. Sewage is emptied into nine cesspools, located around the building. Upon examination it was found that in one portion of the jail, where a hall had been used for cells, the light and ventilation were entirely unsatisfactory. In the men's part, ventilation is secured by means of three ventilators, and the closet and sink, with their surroundings, were in an uncleanly condition.

The beds were not regularly made. The cells were close and not cleanly. The female part had but one inmate. It is merely two rooms fitted up, and this portion was clean and well lighted. The condition of the institution as a whole is far from creditable, and a new structure is much needed. More careful supervision would very much improve matters.

OCEAN COUNTY JAIL.

Located at Toms River. Number of inmates, 6. Ventilation is obtained by windows and doors only. Heating is by stoves. Prisoners bathe at their own option. A visit to this institution was much more satisfactory than formerly; the tanks, which at a former visit, were found empty and with entire absence of flush existing in the closets, at the time of this visit were found filled and the flush ample. The cells were in excellent condition. The jail is a small one and the arrangements are plain. It is a pleasure to note the improved conditions and evidence on every hand of increased care and attention.

PASSAIC COUNTY JAIL.

Located at Paterson. Number of inmates, 85. Water-supply is obtained from the Passaic Water Company. Cellar is dry and well lighted, and is used for storage. Closets, &c., are connected by drain with the main sewer. Ventilation is secured by windows and skylights. Heating is by steam radiators. The report from this institution is very full and the details carefully entered into. An inspection of this jail was very satisfactory. The upper row of cells in the female portion was the only part of the jail that was at all objectionable, and this was due entirely to the construction. The other portions of the jail were very cleanly and convenient, and careful management and system were apparent on every hand.

PASSAIC CITY ALMS-HOUSE.

Located at Passaic. This city has just purchased a farm for the care of its poor and will soon provide itself with new buildings and better facilities than have heretofore existed. The former system of renting a house and giving it over to the poor themselves, and allowing them to care for themselves, was very unsatisfactory, and it is a pleasure to note the expected improvement on this method.

PATERSON CITY ALMS-HOUSE.

Located at Paterson. Water-supply from a well 80 feet deep and 3 feet 6 inches in diameter; water-supply also from a running brook. There are bath-rooms on two floors and systematic bathing is required. Buildings are heated by steam. All inmates have been vaccinated recently. Ventilation by windows. Sewer empties into the brook. Number of inmates, 170. The buildings are well kept and all the rooms are cleanly, but there is need of painting and re-flooring in some parts of the building. There is very decided improvement in the institution since a former visit.

SALEM COUNTY ALMS-HOUSE.

Located at Woodstown. Number of inmates, 54. Water-supply is from a spring and also from wells and cisterns. The cellar is dry and is used for storage, &c. It has a cemented floor. Water-closets are outside of the building. Waste liquids are carried by an open ditch. Ventilation is secured by means of windows and a ventilator in the ceiling. Heating is by means of steam radiators. Inmates are bathed on entering the institution, and then every one or two weeks. Hot water is only supplied on the first floor. The asylum, which is connected with the main building at the west end, is three stories high. There is a bath-room on the first floor, but no hot-water supply. The present closet should be replaced by a better one, connected with an automatic flush-tank. There are seven inmates. The drainage from this building runs to the ditch by an open brick gutter. There was an evident lack in this institution of system in throwing open windows and in the care of beds. Hot water should undoubtedly be supplied to the bath-room in the asylum part. All the drains should be carried to the brook. The asylum, taken as a whole, is cleanly and well kept. The attention of the committee was called to the necessity for the changes mentioned above, and immediate response promised.

SALEM COUNTY JAIL.

Located at Salem. Number of inmates not given. Water-supply is from the city water works, located three miles out of town. The cellar, which is dry, is used for the storage of wood, and a portion of it as the city lockup. Water-closets are provided, which are connected by drains with the sewer. Ventilation is by windows. No report is made as to whether bathing is in force.

BRIDGEWATER TOWNSHIP ALMS-HOUSE.

Located near Somerville. Number of inmates, 10. The cellar is dry and well lighted; whitewashed twice each year. Laundry and wash-water is carried out and emptied on the ground. Water is obtained from a well 56 feet in depth. Baths are given when necessary. At the request of the committee an inspection was recently made of this institution for the purpose of examining the new building which has recently been constructed. Heretofore, although the main building had been in a very satisfactory condition, it was only used for the care of the females, and the men were kept in a part of the farm building outside, over a wagon-house. Upon one of our former visits we strongly objected to this arrangement, and asked the committee to consider the necessity of making some other provision. In accordance with this request they appropriated a sufficient amount of money to erect a new building near the main building, to be used entirely for the men. This new building is two stories in height, and, although it has no cellar, is located on high ground. The building is 36x32 feet and contains eleven rooms in all, separate bed-rooms being provided. It is the intention of the managers to have all inmates leave their rooms during the day and have them properly aired. The sitting-room is to be heated by a stove. The committee are to be congratulated upon the work accomplished and the small cost of construction. It was suggested that hereafter all new inmates be thoroughly cleansed before allowing them to go to the new building, and that no tramps or transient inmates be put in it; that the old quarters be reserved for such persons. The only point that has been omitted in the construction of the new building is the provision for a bath-room, but this can be arranged for at any time. The women's building has always been kept in a neat and cleanly condition.

HILLSBOROUGH TOWNSHIP ALMS-HOUSE.

Located at Neshanic. Buildings are those of a farm, being of wood, and there is a large farm attached. Water-supply is from a well. Heating is by stoves. There are no inside fixtures. Number of inmates, 9. The examination of this institution was satisfactory, all portions being in a cleanly condition.

SOMERSET COUNTY JAIL.

Located at Somerville. Number of inmates, 8; 359 during the past year. Inside closet arrangements are provided, and the drains from these empty into a cesspool. There is an opening in each cell, connected with two ventilators at the top of the roof, and in this way a change of air is provided for. Heating is by stoves. No bathing facilities. Water-supply is from wells and city water, which is taken from the Raritan river. The visit to this institution showed that the men's side was well lighted. The closet arrangement is a trough with a plug, which is lifted out for emptying. The cells were carefully examined, and with the exception of the bedding were in good order. At the time of the visit the Warden was away for the purpose of securing new bed-clothing, so as to entirely overcome this objection. The fixtures were properly trapped, and the soil-pipes carried to the roof. Proper hopper closets might well replace the present arrangement. The female part is an exact duplicate in construction of the male portion of the jail. The sanitary condition of the jail throughout was excellent.

SUSSEX COUNTY JAIL.

Located at Newton. At this place the old jail was inspected some time since, and very many objectionable features were found to exist. A communication was addressed to Judge Magie, who called the attention of the Grand Jury to the existing conditions. A committee was appointed by them to make a report as to the whole matter. The report of this committee fully justified the Board in ordering the construction of an entirely new jail, on modern plans; and we are pleased to state that the jail is in process of construction, and that the objectionable conditions which existed heretofore will be entirely overcome.

SUSSEX COUNTY ALMS-HOUSE.

Located about four miles from Newton. Number of inmates, 92. Water-supply is from a spring. The basement is dry, but not very well lighted. No regular system as to bathing is in force. A visit to this institution found several defects, which were as follows: There were on each floor a slop receptacle and a trough for closet purposes. These were in wretched condition, and the plumbing throughout the institution was very unsatisfactory. The flush to the closets was insufficient, and the troughs themselves were not clean. The house-drain ran under the building, passing under the laundry, where there is an untrapped opening. From this opening we were informed that foul odors frequently arose. The drain-pipe finally empties into the brook below. The water-supply is excellent. After the visit a communication was addressed to the Managers, urging upon them the necessity of thoroughly overhauling the plumbing of the building and taking up the house-drain, and that an effort should be made to secure improved conditions throughout. This met with a hearty response upon their part, and it is probable that by this time the whole matter has received attention.

UNION COUNTY JAIL.

Located at Elizabeth. Number of inmates, 52. The water is obtained from the Elizabeth Water Company. The cellar is dry and well lighted and is used for coal storage and steam boilers. Heated by steam. Ventilation is by windows and ventilators in the rooms. Compulsory bathing is insisted upon each week, and oftener if necessary. The examination of this building was very satisfactory. The discipline is excellent, and the condition of the whole jail showed cleanliness and good management. If separate hospital facilities could be supplied it would be a great advantage.

ELIZABETH CITY ALMS-HOUSE.

Located at Elizabeth. Number of inmates, 51. There are two wells, one about 10 feet from the main building, and the other 150 feet, which supply water to the buildings. Both of them are very deep; but the exact depth is not given. The basement, which is about four feet in depth, is dry and well lighted; on the west side in the basement there are some cells, in which eight aged people sleep; there are no indoor closet arrangements. Soiled liquids from the building are carried by a drain to the meadow below. Building is heated by steam. Inmates are bathed on entering and compelled to take weekly baths. The institution was found in better condition than formerly, but bathing facilities could be much improved by the introduction of the city water-supply, and it would be better if the rooms in the basement were not used for sleeping compartments.

RAHWAY CITY ALMS-HOUSE.

Located at Rahway. Number of inmates, 9. Water-supply is from two wells. No inside closet arrangements. Ventilation only by windows. This institution is heated by stoves. There is but one bath-tub, and bathing is compulsory once a week in the summer. The building was cleanly and in excellent condition. Many of the floors are old and the walls rough, but everything showed care. There is a hospital for contagious diseases located within a short distance of the main building.

WARREN COUNTY JAIL.

Located at Belvidere. Number of inmates, 8. The largest number of inmates during any one time within the past year was 18. Water-supply is from the public supply of the town. No statement is made as to the bathing regulations. The laundry work is done by the prisoners themselves in the jail. The inspection of this institution was not entirely satisfactory. The old portion of the jail, which is not used, shows very poor arrangement. The new portion of the jail on one side is well lighted, and the arrangement satisfactory; but that portion of the jail nearest the residence of the Warden is so badly lighted that it is necessary to use lamps at times, for the purpose of examining the cells. Under such circumstances it is but natural that there should be an overlooking of the details of good housekeeping.

WARREN COUNTY ALMS-HOUSE.

Located at Townsbury. Number of inmates, 59. The water is obtained from a large spring about half a mile distant from the institution. The spring is covered. No inside closet arrangement. All soiled water is thrown on the surface. Ventilation only by raising windows or opening doors. Heating is by stoves. No regulation as to baths; the only bath-tub being in the wash-house, some distance from the main building. The inspection of this building revealed so many defects, both as to management and structural detail, that a letter was addressed to the Board of Chosen Freeholders, calling their attention to the necessity for making many necessary changes. The building occupied by the men showed evident lack of oversight, and it was suggested that there was need of better system for bathing inmates, also a separate building or portion of a building to be used for hospital purpose, and that both the heating and ventilation could be very much improved. A conference was had with the Director of the Board, and he assured us that immediate attention would be given to the matters presented.

The outlines which have been given in the foregoing statement as to institutions are only a few of the items which might have been taken from the reports made. A careful examination of the reports in full is very interesting. In many instances where attention has been called to defects these have already been remedied. The statements as to the sanitary condition of the institutions are made with reference only to the time of visit, but since that time change of administration and methods may have produced entirely different conditions. There are certain institutions in the State which will bear especial examination and study, and that may well be taken as models for other localities to follow. The institutions that we would especially draw attention to are the State Prison, the Union County Jail, the Essex County Penitentiary, the Hudson County Penitentiary and the Passaic County Jail. Among the asylums, the two State institutions, the Essex County Asylum and the Camden County Asylum are especially worthy of note.

HEALTH CIRCULARS AND LAWS.

During the past year most of the circulars of the Board have been reprinted, and all of them have been carefully reviewed. They are supplied singly as wanted, and together in stiff cover to members of Local Boards of Health and to Inspectors. Circular 75 ("The Inspector's Guide") is also bound together with Circular 80 and Circular 60. All these are now in such form and so available as to add to the permanent sanitary literature of the State. The demand for them shows how much they are valued for the guidance of Health Boards in their duty. These and the health reports are believed to cover the entire range of sanitary administration. We issued, the past year, Circular 78, as to Institutional Inquiry, in book form, and herewith give its questions and notes to show its general scope. Circular 79, as to Marriage, was rendered necessary by addition to the law and by desire on the part of many to have, in condensed form, the laws as to it. Circular 80, as here given, has been combined with Circular 60, and another Circular 80 substituted in its place, viz., "As to Traps, Vent and Soil-pipes." As the substance of this was in the last report, it does not need reprint in this report.

All circulars are also combined in a small book with stiff cover, and can be had by all those in official charge of all local health matters.

The Health Inspector's Guide, Circular 75, also now reaches its third issue, with some additions. It is believed that we thus furnish to Local Boards, to Health Inspectors, and to the people, permanent advice and directions as to the most important sanitary subjects. There will rarely be need for other circulars, but these will be added as indications require.

The following is the list of circulars:

LIST OF SELECTED CIRCULARS OF THE NEW JERSEY STATE BOARD OF HEALTH TO 1893.

CIRCULAR 7.—Protection to Bathers.
" 27.—Sanitary Instruction in Schools (No. 1).
" 28.—School and Health Circular, No. 2, for Parents, Children, &c.
" 29.—Charitable and Penal Institutions.
" 30.—Sanitary Survey and Topography.
" 37.—School and Health Circular, No. 3.
" 39.—To Local Boards of Health—Their Duties
" 40.—Health Counsels for Working People. Industrial Circular, No. 1.
" 41.—Health Counsels for Working People. Industrial Circular, No. 2.
" 42.—As to Petroleum, Kerosene, &c.
" 44.—How to Prevent the Spread of Small-pox, Scarlet Fever, Diphtheria and all Communicable Diseases. As to Vaccination.
" 45.—Cholera and Annex of 1892.
" 47.—Prevention of Injuries to the Mind, the Eyes, the Ears.
" 50.—The Contagious Diseases of Animals.
" 52.—Blanks for House Inspection (Check-book Form).
" 53.—Pure Drinking-Water—How to Secure it.
" 54.—Sanitary Inquiry as to Schools (Check-book Form).
" 57.—To the Physicians of the State
" 59.—Laws and Regulations as to the Adulteration of Foods or Drugs.
" 60.—Laws Relating to Public Health.
" 61.—Care of Household Wastes.
" 62.—Drainage for Health.
" 63.—Farmers' Homes and Their Perils.
" 64.—Disinfectants, and How to Use Them.
" 65.—Construction, Plumbing, Ventilation and Drainage of Buildings.
" 66.—Laws and Directions as to Marriage, Birth and Death Returns.
" 67.—To Funeral Directors, &c., as to Care and Burial of the Dead.
" 68.—To Local Boards (Spring Circular).
" 69.—Meat, Poultry, Game or Fish as Foods; How to Judge Quality.
" 70.—Occasional Bulletin Series—Laws, Health Inspectors, &c.
" 71.—As to Sanitary Inspection of Hotels, &c., at Resorts.
" 72.—Vital Statistics—Their Uses.
" 73.—Cities—Their Needs and Their Regulations for Promoting the Health of Their Inhabitants.
" 74.—October Circular as to Annual Report of Local Boards.
" 75.—Health Inspector's Guide (Book Form).
" 76.—Protection of Schools from Communicable Diseases (No. 4).
" 77.—Diphtheria.
" 78.—Institutional Sanitary Inquiry (Check-book Form).
" 79.—Laws as to Marriage.
" 80.—Traps and Vents in House Soil-pipes. Testing of Pipes.

☞ Any of these can be had on request by postal.

The following circulars we print in this report as either new or so modified as to need reproduction:

Circular 78, institutional inquiry.
Circular 79, as to marriage.
Circular 45, as to cholera.
Annex to Circular 45, as to cholera.
Circular 44, as to small-pox, vaccination, &c.
Circular (special), as to additional laws.

NOTE.—This circular has been combined with Circular 60. We reprint it in its original form to draw special attention to some new laws now appearing in Circular 60.

Circular Letter H, to railroad and transportation companies.

The following special slips were issued for this year:

Slip for October blank, 1892.
Slips as to cholera, Nos. 1 and 2.

CIRCULAR LXXVIII.

INSTITUTIONAL INQUIRY INTO SANITARY CONDITION.

Circular 78, as prepared in new form and with many additions, is here given:

Sanitary record of..
P. O. address..
Township of..
County of..
By ....
....Date of survey.

TO THOSE IN CHARGE OF INSTITUTIONS.

In order to ascertain facts accurately, a schedule of questions is found necessary. Either the Keeper or the Board of Managers or the Physician can generally answer these questions, and for each other's information, as well as for that of the State, should be able to do so. Two copies are furnished—one to be filled out and kept at the institution, ready for reference by the officers and by the State Sanitary Inspectors, the other to be filled out and forwarded to the office of the State Board of Health, Trenton, N. J. It should always be sent within one month after being received.

As this circular goes to alms-houses, reform schools, asylums, prisons, &c., there will be occasionally a question not applicable to each, but in general every question admits of answer. Take time to answer accurately, and do not guess. The Manager may well spend a day in getting information as to each particular, and then the copy he keeps will be of service to him and other officers, both for its facts and as a reminder of items which they need to know.

This inquiry has only to do with matters relating to health, and relieves those who are studying *individuals or questions of management* from the necessity of looking after sanitary details Any apparent sanitary defects should be at once reported to this Board. Unless you have it, send by postal for our Book of Circulars, which will tell you many things you need to know. It must be kept in the institution for reference.

In the larger institutions the Health Inspector's Guide (Circular 75) will also be found convenient. Send for circulars as needed.

By order of the Board,
EZRA M. HUNT, M.D.,
Secretary.

For convenience of description in giving size, location and relation of buildings with each other, we give some simple forms or diagrams upon which various facts can be shown by lines and letters.

We give, first, a Marked Plan of Premises as a specimen of how to use these forms, with the following

EXPLANATION:

These spaces may represent areas of 5 feet square, or a total area of 20,000 square feet—the dimensions of the block being 100 feet by 200 feet.

Taking the bottom line for the front of the lot, indicate by a pencil line the size and shape of the lot—leaving a margin on each side if there be room.

Next outline the size and location of the house and other buildings.

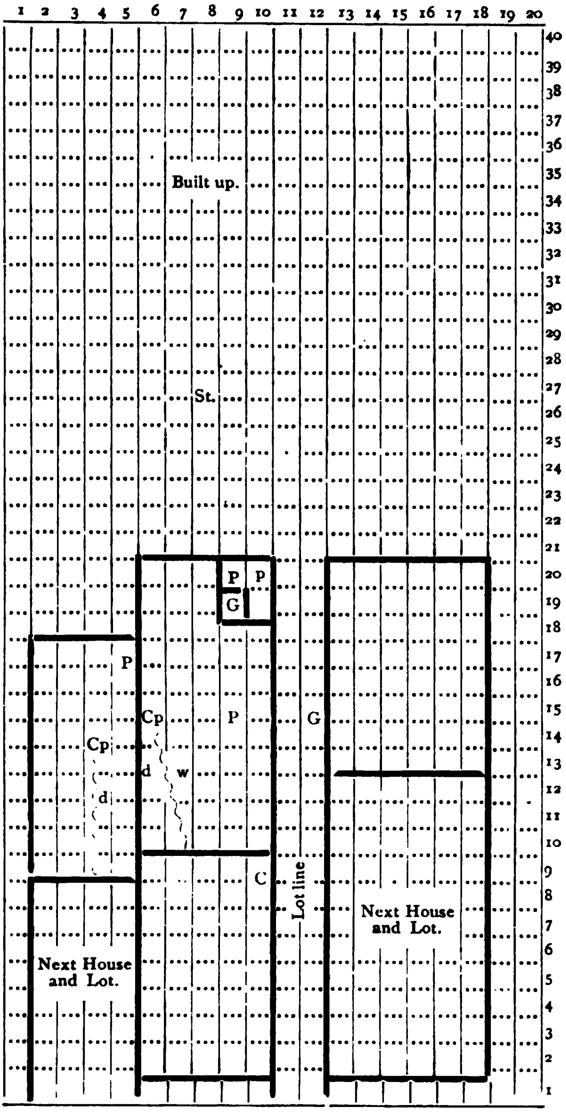
Then indicate by letters the location of the well (by *W*), cistern (by *C*), privy (by *P*), cesspool (by *Cp*), garbage (by *G*), stable (by *St*), pig-pen (by *Pp*).

Also the course of drain or pipe from the house by a dotted line with the letter (*d*) at the waste-pipe or dotted middle if it is a drain or cesspool, or by the letter (*s*) if it be to a sewer.

Part of the diagram, or another, may also be used to show size of rooms, inside stories, ventilating, heating, &c., if the lettering is explained.

SPECIMEN OF MARKED PLAN OF PREMISES.

South Street.



No. 24. 26

Spring St.,

Front: N. E. S. W.

Opposite Bone-Crushing Factory.

SPECIMEN SCHEDULE OF SANITARY INQUIRY AS TO ALL PUBLIC INSTITUTIONS WITHIN YOUR INSPECTION DISTRICT.

1. Name and P. O. address of institution.

2. Name and P. O. address of chief officer.

3. Name and P. O. address of physician.

4. Name and P. O. address of at least two directors or managers living nearest.

5. Location as to surrounding land and height above sea-level, if known.

6. Character of soil around buildings.

7. How many acres in all?

8. Is there an accurate geological map and description?

9. Are there contour maps, topographical maps, and a plan and schedule of all underground apparatus or pipes?

WATER-SUPPLY.

In all institutions there is need to look carefully after the water-supply. If good in general, it may, at times, become poor. Wells get out of order, or slop or bad water of some kind finds its way to them through the soil. Cesspools or drains may be too near, and in very dry weather or from other causes there is a flow toward the well. Pipes, or cisterns or reservoirs also get out of order. When water tastes or seems bad it should always be boiled before use, and until the evil can be remedied. (See Circular 53, on Drinking-Water.) In cases of any prevailing fevers or bowel affections among the inmates, the water-supply should be suspected.

As milk is largely used in many institutions, it too needs careful guarding; for if good in itself, it may become fouled by the use of dirty water in rinsing cans, &c. It easily absorbs foul odors, and its condition always needs to be watched.

10. Have natural water-courses been turned or changed in any way?

11. Is there any damming up of water for ponds, and if so, how near to buildings?

12. Give place, size, depth, character and locality of any springs and wells.

13. Are they open or closed, and what is the mode of getting water therefrom?

14. Are any slops spilled or vessels rinsed about wells, or is the ground near in any way foul?

15. State fully any and all sources of water-supply.

16. Is water introduced into buildings?

17. If so, state each place and each floor. Is it by pump or by faucet?

18. Is it through lead pipes?

19. Is there a cistern, and if so, where? Describe its construction.

20. Is the water used for both drinking and general purposes and handy in case of fire?

21. Is the supply of drinking-water abundant and satisfactory, and if not, state objection?

22. How many buildings are occupied by persons? (Show them on diagram.)

23. Size of buildings and material. Estimated value.

24. Date of erection. Who owned by.

25. What additions since, and when?

THE BASEMENT OR CELLAR.

The condition of no part of the house is more important. The air of the cellar gets into the house, and especially with our modern systems of heating. It is too often the place of dampness and moulds, of decaying vegetables and stagnant air.

The great remedy is good airing, the frequent removal of all of its contents out-of-doors on a sunshiny day, and the liberal and frequent use of whitewash. By this we mean not a standing barrel, but fresh quicklime whitewash, which, if often applied, does so much for cleanliness. As a rule, fresh air, hot water, whitewash and good chloride of lime are the most ready and useful disinfectants. Let light and sunlight, too, get often to each part as far as possible.

Of course all parts of a public institution need special housekeeping and care, and often special rooms need to have their special and frequent room-cleaning. But the basement is most apt to be neglected. Next in neglect to it is the attic or garret, which we have too often found the stow-away place for old shoes, old clothing and general rubbish, where broom and scrub-brush seldom enter. Where we find a clean cellar and a clean attic, we have always found the rest of the house in order.

26. Describe basement or cellar: (*a*) How much above ground? (*b*) Is it dry? (*c*) Is it well lighted? (*d*) How used? (*e*) Is there kitchen or laundry in it?

27. Does any one sleep in basement? (*a*) If so, how many, and who? (*b*) Are vegetables stored in it? (*c*) Is it frequently whitewashed? (*d*) Is the floor cemented? (*e*) Has it plastered walls? (*f*) Is the floor ceiling lathed and plastered? (*g*) Is there a milk cellar, and if so, describe it?

28. Size of rooms for bed or sitting-rooms on first floor.

29. Size of rooms for bed or ward-rooms on second floor.

30. Size of rooms for bed or ward-rooms on third floor. (Height of ceiling in each case.) (*a*) Describe attic.

31. What is the finish of walls? (*a*) Are any rooms wainscoted?

32. Is the number and size of windows enough for air and light? (*a*) How near to ceilings are windows? (*b*) Do the windows let down from the top? (*c*) How is admission of sunlight regulated—by shutters, blinds or curtains? (*d*) Does the sun shine into most rooms some time in the day?

INSIDE PIPES, FIXTURES, ETC.

The water-pipes, gas-pipes, sewer-pipes, &c, inside of a building always require inspection from time to time. Leakages are always most serious, and often occur when not suspected. Pipes themselves become foul by lack of fresh-air vents and defective flushing.

Fixtures often have too much woodwork about them, and pipes are laid so as to be difficult to get at. All these evils should be remedied as far as possible, and repairs or new work should be of the best.

As Circular 75 of the Board, known as the Inspector's Guide, is now published in book form, and can be had by any institution on application by postal, it is not necessary here to give full details as to pipes and fixtures, and as to modes of inspection in general.

33. Are there inside closet arrangements, with water-flush; if so, where do drains go from these?

34. Does all soiled water from building go by drains to one sewer or to one cesspool? (Show on diagram.)

35. How are these pipes or sewers ventilated?

36. Is there a manhole or opening where the pipes come from the building, connecting with some vent or ventilation outside or open to the air?

37. Is there a trap as the pipes come out of the building?

38. State the material and mode of laying of pipes, and their size.

39. Give the fall of pipes or sewers, if known.

40. Is the flow ever sluggish?

41. How is laundry and wash-water gotten out of the building?

42. Is there any grease-trap at kitchen or laundry, where pipe comes out of building?

43. State the indoor closet arrangement in full, and kind of closet.

44. Are water-closets in separate projections, with windows, and well ventilated?

45. Are there traps under each house fixture, and of what kind?

46. If no inside closets, what is the out-of-door arrangement?

47. How often is material removed, and by what method?

48. Are fecal and slop material put together?

49. Where are slops emptied? (*a*) Are any slops run by pipes or emptied into the privy vaults?

50. If one or more cesspools are used, describe them as to size and location.

51. How are they cleansed, how often, and what is done with the contents?

52. What is the water-supply?

53. Is it brought on all floors, and how?

54. How is the water stored?

55. If in cisterns, how often are they cleansed?

56. Is there an overflow-pipe? (*a*) If so, how trapped, and joined to what outlet?

57. Where there is a cistern, is provision made for the "washings" of the roof to be carried off first?

58. Of what material is the roof?

59. If no cisterns, how is the roof-water disposed of?

60. If water is got from wells, what are the chances for contamination with sewage or surface drainage?

61. Is there any reason to suspect impure water?

VENTILATION AND HEATING.

This is one of the most difficult matters to deal with in any public institution. Where there is a complete system, either of radiators or hot-water or hot-air pipes, or where, as in indirect heating, fresh air is warmed over coils in a basement and then introduced by register, it is generally under the charge of some engineer, and so is more likely to receive skilled attention. In these cases, also, there is generally some system of ventilation which is or can be regulated by rule.

But in very many of our institutions there is dependence upon furnace heat, or open fires, or upon windows, doors, halls and fire-places for ventilation. In the use of these, the great problem is, without draughts, to secure proper temperature by the regulation of registers and fires, and proper ventilation by the opening and shutting of windows, doors, &c. This is sure to be interfered with by inmates, unless there is exactness of method and discipline. The thermometer should in all cases record the actual heat, and its regulation be in charge of some one of the inmates or other proper person.

The opening and shutting of windows should also be under rule. The tendency is to shut out the outside air whenever it is a little cool. This is in part prevented if there is a plan to let in air without draught. This is best done by having a piece of board hinged fast to the window-sill just about the width of the lower piece of the lower sash. If the lower sash is raised just enough to admit this to be put in place, and then is shut down on the board, a space is left at the middle, between the upper and lower sash, which will admit air constantly, and yet give no draught on persons. Such a simple device, or some similar one, should be found in all houses that cannot have more extended arrangements.

62. What is the system of ventilation?

63. Give full plan.

64. Have there been anemometer or other tests as to circulation of air and draughts?

65. Is there any provision for changing the air of rooms during cold weather?

66. Have the heating and ventilating appliances been tested in varying conditions of atmosphere?

67. What is the method of heating?

68. Give plan.

69. State whether there are registers, pipes or radiators, and in what rooms.

70. How many and which wards or bed-rooms have fire-places?

SANITARY CARE OF INMATES.

However well a house or institution may be kept in the sense of housekeeping, this will not suffice unless there is general cleanliness on the part of inmates It is the great care and responsibility of most managers of institutions that the proper keeping of persons is more difficult than the keeping of the house. It is here that the capacity and fitness of the Superintendent are most shown.

There must be a full knowledge of what is necessary to be done, and how to do it. The bodily state of each inmate, as to cleanliness, needs to be known.

There must be such rules as will secure careful method It must be seen by frequent inspection that they are carried out. The great evil of most of the dependent classes is that they are not used to system or order; hence too often there is a disorderly lack of care and neatness. To those who say that it is impossible, for instance, to keep an alms-house and its inmates in cleanliness and order, the best answer would be to take them to some we are able to show. We only ask that all having charge of institutions see to it that persons as well as buildings are kept clean, orderly and decent. Constant vigilance and industrious oversight must be secured. It will not do to keep institutions as many were kept twenty years ago. There has been progress here, as in other matters.

71. How many inmates are there in all? (*a*) How many males over sixteen? (*b*) How many females over sixteen? (*c*) How many of the inmates were born in the institution?

72. How many the last year?

73. How many children are there under five years of age?

74. How many between five and twelve?

75. How many from twelve to sixteen?

76. How many of all these have been vaccinated? (*a*) How long since?

77. Have all adults been vaccinated within ten years?

78. What are the facilities for usual hand and face-washing of inmates?

79. What are the towel arrangements?

80. What for bath-tub bathing with warm water?

BATH-ROOM.

To any public institution there is no one provision in structure more important than a *bath-room*, fully provided with hot and cold water. Generally the shorter form of bath tub is sufficient. Where there is no bath-tub, until it can be supplied a room should be set apart for bath use and a portable bath-tub provided. Of course all cannot bathe on any one day. For this and other reasons all should have their appointed time, and exceptions should only be made of necessity, by the Steward. Those who are too feeble should be assisted, and some bathed by others in their rooms. There is no important thing so often neglected. Even where we find bath-rooms, we often find lack of method and neglect

A register should be kept of when each has had a full bath. Where a perfect system is carried out it adds not only to cleanliness, but to the good discipline and order of the inmates. There is something reformatory in cleanliness.

In institutions, the water-closet, while easily accessible, should not be in the bath-room. One of our largest alms-houses has a bathing-master for the men's department, and the good results are apparent. Generally the female department equally needs oversight. Hereafter keep your bath register. It is impossible to keep most of our public institutions in a clean condition unless there is this bathing system. Often we find the worst evidence of body-uncleanliness in the smaller institutions.

Let no Keeper excuse himself from this care because there is no bath-tub and no pipes for delivery of hot water. What cleanly person would be willing to live in an alms-house in which were inmates who never washed?

Besides change of underclothing, attention needs to be given to the condition of other garments. We visit many alms-houses where greasy and dirty coats, pantaloons, vests or frocks make cleanliness impossible. It is far cheaper to provide plain, new clothing than to put up with the results of filth. Often boots and shoes can be cleansed and dried by the use of common disinfectants (see Circular 64), or by filling them over night with finely-powdered charcoal. As to many other matters, see Book of Circulars.

81. What are the regulations as to baths, and how fully are they carried out?

82. Do you keep a list of who have had full baths, and how often, and of those who are washed by others?

83. Besides the personal comb and brush, are there a comb and brush fastened by a small chain in the wash-room?

84. Is the hair of inmates kept properly cut or cleansed?

85. Is there a regular system of changing underclothing?

86. How and where is laundry and ironing work done?

87. Is there any system by which new suits of plain outside clothing are furnished to inmates, and by which clothing long worn is cleansed by airing or heating?

88. Have you a separate place or hospital for those taken sick, or are persons attended in their rooms?

89. When a new inmate is presented, what facilities have you for thorough cleansing before admission to the general rooms, or for separation for a few days, in case of any suspected sickness?

90. Have there been any accidents since last report; if so, what?

91. Are inmates fed at a common table except in case of sickness?

92. Have you a regular dietary for each day?

93. If so, give the diet table for each day.

94. Are the bedsteads wood or iron?

95. What form of mattress is used, and how often changed?

96. Does each inmate have a separate bed?

97. Is bed-linen changed each week?

98. How often are all contents of rooms, and especially bed-rooms, moved out and rooms scrubbed and whitewashed, as in general house-cleaning?

99. What facilities have you, besides ordinary house-cleaning, for cleansing and varnishing furniture?

100. What fire-escapes, buckets, extinguishers or other provision in case of fire?

101. What is the method of lighting?

102. Is any register kept of inmates as to habits, cause of dependence, mental condition, &c.?

103. What are the hospital arrangements? What is the cubic space of hospital ward?

104. What is the cubic space in common sitting-rooms and in dormitory?

105. Is there any oversight of, or inquiry into, the physical condition of inmates?

106. Is there a record of causes or history of the cases of those bed-ridden or fully incapable of labor?

107. What was the expense of maintenance last year?

108. What is the plan of outdoor relief, if any?

109. What was its cost last year?

110. Have you any insane paupers? (NOTE.—If you have an asylum attached, give all facts as to it in a separate book of record, the same as this.)

111. How many are demented or foolish or epileptic?

112. How many such are harmless?

113. Are they, or should they be, separately kept?

114. What are the arrangements for separation of males and females?

115. What are the nursing arrangements?

116. What is the medical attendance?

117. Does the physician come at stated times, or only when sent for?

118. How much is paid him per year?

119. How are medicines furnished?

120. Are any disinfectants kept on hand?

121. If so, what are they and how used?

122. Inform us what changes are needed in any present arrangements.

123. Physicians will state facts of interest regarding sickness during past year, or sanitary defects existing.

124. What was the number of deaths and their causes last year?

125. Have you any system of employment for inmates?

126. What is the discipline and oversight of attendants?

127. Is any special industry followed?

128. If so, give particulars.

129. Is it profitable or merely for occupation?

130. How many inmates have tobacco furnished them?

131. How many have opium furnished them?

132. What was the tobacco bill last year?

133. What was the liquor bill?

134. What was the quinine bill?

135. What are the arrangements for schooling children?

136. Are any apprenticed out, and at what age?

137. Are places sought for any not apprenticed?

138. What visitation or instruction have you that looks after the moral welfare of the inmates, and what provision therefor?

139. What provisions are there for amusements or for reading matter for inmates?

140. Have any been detained as witnesses during the past year, and how long? Give particulars.

141. What system have you for receiving excretions of the body during the night?

142. What in cases of sickness?

143. What are the chances for sunlight to enter cells and corridors?

144. Are prisoners allowed to smoke and wash in their cells?

145. Cubic space of each cell.

146. What chance for change of air in cells?

147. If prisoners are taken ill in the night, how may they summon assistance?

148. Size of windows in cells.

149. Size of doors.

150. Amount of sickness and number of deaths within one year.

To show the contrast between the work of Sanitary Inquiry and that of a Council of Charity and Correction or a Charity Aid Association, we append the schedule of questions used by the latter in such investigations, as outlined by Hon. William P. Letchworth of New York State:

QUESTIONS FOR THE USE OF VISITORS.

1. Number of paupers examined.
2. Birthplaces.
3. Birthplace of parents.
4. Native or alien. Where born.
5. Ages at the time of becoming inmates of alms-houses.
6. Ages at the time of the examination.
7. Length of time in the alms-house.
8. Other forms of relief furnished.
9. Education—intellectual or moral.
10. Habits.
11. Habits of parents, so far as ascertainable.
12. Habits of the insane.
13. Previous occupations.
14. Previous industrial habits. Present occupation.
15. Condition of ancestors and other near relatives.
16. Grouping of families in alms-houses.
17. Condition of the children of alms-house inmates.

18. Existing cause of dependence, such as—
    - *a.* Homeless children—illegitimate.
    - *b.* abandoned.
    - *c.* by death of father.
    - *d.* by death of mother.
    - *e.* by death of both parents.
    - *f.* by pauperism of parents.
    - *g.* by imprisonment of parents.
    - *h.* Homeless women—abandoned by husbands.
    - *i.* by death of husbands.
    - *j.* Old and destitute.
    - *k.* Permanently diseased.
    - *l.* Temporarily diseased.
    - *m.* Crippled.
    - *n.* Deformed.
    - *o.* Blind.
    - *p.* Deaf-mutes.
    - *q.* Insane.
    - *r.* Idiots.
    - *s.* Epileptics.
    - *t.* Paralytics.
    - *u.* Feeble-minded.
    - *v.* Vagrant and idle.
19. Future of the inmates of alms-houses.
20. Report what ought to be done with each individual.
21. Rules and regulations for alms-houses, &c.
22. General conclusions.
23. In case of any special sanitary defect, report to the State Board of Health, Trenton, N. J.

The special work of a State Charities Aid Association, as distinct from that of a Sanitary Board, or Board of Health, is well emphasized in such a circular as the following:

COMMUNICATION FROM THE BOARD OF MANAGERS OF THE STATE CHARITIES AID ASSOCIATION OF NEW JERSEY.

Circular A.

The State Charities Aid Association of New Jersey desires to draw your attention to the work in which it is engaged, and to secure your interest in and co-operation with it.

Its design is to consider the great questions that relate to the dependent and criminal classes of society, and practically to put in execution the best methods for dealing with these classes and of diminishing their number.

It enters the alms-house in order that it may look after the condition of its inmates and to see how far this may be improved, what can be done to help some to self-support, to secure the best practical care of others, to prevent the bringing up of children in alms-houses, and in every way to bring up our system of alms-giving and care to the best standard of excellence. In doing this it seeks not only to study the needs of those already dependent, but to so ferret out the causes of dependency as to diminish the number of those who will hereafter have occasion to seek support.

It visits the prison and the jail in order to aid in carrying out the true ends of punishment, and yet secure such influences as will either reform the prisoner or prevent him from becoming a source of evil to others. It also seeks information as to the chief causes of crime, and to abate these by the most effective methods.

It inquires into the asylums in order to know the relations between insanity, pauperism and crime, since these public charities are provided with especial reference to the pauper element of society. It makes also such investigations as to other forms of dependency, weakness and want as are collateral to the work of such institutions.

CIRCULAR LXXIX.

OF THE

STATE BOARD OF HEALTH OF NEW JERSEY.

MARRIAGE AND THE STATE LAWS AS TO IT.

The relation of marriage has to do with the fundamental interests of society. Whatever theories may have been advanced heretofore, or whatever customs may have been in vogue in different countries, the constitutional governments of modern civilization take it for granted that the family is the basis of the State. They recognize no other unit of population. They concern themselves with the act and condition of marriage, not merely because of certain legal necessities growing out of it as a compact and contract, but because its conditions concern national existence and national permanency. A nation consisting of unmarried men and unmarried women is inconceivable. Marriage is a part of the organic law of nations; a necessity for perpetuity. The fact that the law recognizes it as a civil relation does not in the least remove it from its close moral and social status. Although a contract, it is not dealt with as an ordinary contract; although regulated wholly by statutory provision, yet the statutes respect ecclesiastical views as to many of the relationships beyond those of blood kinship, and still recognize the priest or minister as the chief officer to declare any such union consummated. It speaks of solemnizing marriage, by joining persons in the holy bonds of matrimony, and throughout applies such language to the act as conveys the idea of solemn compact.

The law holds itself in close relation to all that concerns it, and claims the right to place upon it, and the modes and places of its performance, such restrictions as it believes the welfare of the State to demand. It therefore must give expression to this care in such ways as seem to conduce to this end, although some of them may seem arbitrary to those who have not fully studied the reasons.

Thus, it arbitrarily defines the age at which a person becomes marriageable without the consent of parents or guardians, and makes the ages different for the different parties to the contract. It prohibits a widower from marrying the wife of his deceased grandson or the mother of his deceased wife, as definitely as if they were of the closest blood relation.

In most countries it has not been considered obtrusive to demand that either the Church or the State have due notice of the contemplated union, on the ground that their interests are essentially involved in the act.

Until a few years ago, in England, marriage was an ecclesiastical ordinance. The celebration of marriages is regulated by statutory legislation. The law requires either the publication of bans or a license from the proper ecclesiastical authority.

France requires bans to be published, and eleven days must elapse, including two Sundays.

In this country, custom varies in the different States.

The Catholic Church is everywhere particular as to a knowledge of the parties. For instance, a priest does not perform the ceremony outside of his parish. The restraints on hasty and improper marriages and upon divorce seem very effective.

Up to 1795 our State law as to marriage was the same as that passed in 1709 under the Crown (George I.) So far as license is concerned, it only required license when either party was under the age of twenty-one years, and then required not only license and such notice as would give full time for parents or guardians to prevent the marriage, but also a bond of indemnity.

In 1795 the law was so altered that the woman desiring marriage could be married after the age of eighteen without consent, but if either the man was less than twenty-one or the woman less than eighteen, certificate of consent must be produced and sworn to as correct by a witness accompanying the parties. It is implied that if the parties claimed to be of age, and the person asked to perform the ceremony had any doubt, he might cause the parties to take oath or affirm their age. Such, at least, has been the precautionary custom with many of those officiating for young and unknown couples.

We are aware that there is a sentiment on the part of many that there are not enough restrictions against hasty or ill-advised marriages, and that there is need of some legislation to secure more deliberation or greater restraint.

Many believe that some form of notice is, in all cases, in the interest of society and of good morals, and so advocate it on these grounds.

Others stand in fear of the penalties for marrying minors. Our present law as to this is explicit and can be easily carried out.

The only real risk arises to the parents or guardian that the child or ward will, by false statement, be married without consent. If there is need of greater guard as to this, how can it be secured? We doubt whether it can be done by the public notice or bans or a previous public license.

The evils result mostly from causes that must be dealt with in families, and have no remedy in legislation. Legislation is not so much a remedy for defects in character and home-training, or for all the infelicities of social life, as some imagine. Yet, as it may to some degree restrain the results of social defects, and conservative legislation may be thought of, some of the suggestions made to us are as follows:

(*a*) One of the parties should reside in the county or city in which the ceremony is performed.

(*b*) The right to join persons in wedlock should not belong to so many persons or classes of officers.

(*c*) No person should be allowed to perform the ceremony unless knowing one of the parties.

(*d*) If license is required at all, it should only be of men under twenty-one and women under eighteen years of age, and only for about three days before marriage.

(*e*) Marriages should not be performed in the State by persons residing out of the State. We do not suggest all these regulations as necessary or expedient, but only to be thought of in preference to a general license law.

These suggestions are made because large and influential church organizations and judicious citizens have given utterance to the view that somehow there should be greater guard put upon hasty or illegal marriages; greater protection to those authorized to solemnize marriage, and fewer marriages of unknown parties. A review of the various laws and a knowledge of some of the evils arising from attempted restrictions, lead us to believe that our laws as to marriage, need no radical change, although some re-statement may be desirable. If everyone who has the right to perform this ceremony would be careful to marry no minor without full questioning and an oath or affirmation that he or she is of full age, there would be fewer hasty marriages, and no liability to the person performing the ceremony. We have found so much misunderstanding of the laws as to marriage in this State, or so much lack of information as to them, that we herewith give a full outline as to the laws and the form of certificate and record:

SYNOPSIS OF THE LAW CONCERNING MARRIAGES IN THE STATE OF NEW JERSEY.

It is hardly necessary to say that the law of marriages throughout the United States is not uniform. Each State has supreme authority to prescribe such regulations concerning marriage as its Legislature may deem expedient or proper. The following is a synopsis of the laws of the State of New Jersey:

I. Who May Not Marry.

It is not lawful for any man to marry his grandmother, grandfather's wife, wife's grandmother, father's sister, mother's sister, son's wife, sister, son's daughter, daughter's daughter, son's son's wife, daughter's son's wife, mother, step-mother, wife's mother, daughter, wife's daughter, wife's son's daughter, wife's daughter's daughter, brother's daughter or his sister's daughter.

It is not lawful for any woman to marry her grandfather, grandmother's husband, husband's grandfather, father's brother, mother's brother, father, step-father, husband's father, son, husband's son, daughter's husband, brother, son's son, daughter's son, son's daughter's husband, daughter's daughter's husband, husband's son's son, husband's daughter's son, brother's son or her sister's son.*

The law of this State does not prohibit any person who has obtained a decree of divorce, or any person against whom a decree of divorce has been obtained, from remarrying.

Where a person has another husband or wife living at the time of the second marriage, such second marriage is absolutely void and the issue thereof illegitimate. Where a marriage within the prohibited degrees above mentioned has taken place, it is not void from the beginning, but it is good ground for divorce; the divorce, however, will not render illegitimate the issue of a marriage so dissolved. Divorces may also be decreed in any case where either of the married persons was, at the time of marriage, physically and incurably impotent, in which case the marriage is invalid from the beginning and absolutely void, and in the case of adultery in either of the parties, and for willful, continued and obstinate desertion for the term of two years.*

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* See Revision of New Jersey, page 631, section 1.

II. *Who May Solemnize Marriages.*

Marriages between such persons as may lawfully enter into the matrimonial relation, may be solemnized by the Chief Justice and each and every Associate Justice of the Supreme Court of this State, by the Chancellor and each and every Vice Chancellor of this State; † by every Judge of any Court of Common Pleas, and Justices of the Peace, Recorder and Police Justice, and Mayor of a city of this State, and by every stated and ordained minister of the gospel; every religious society in this State may also join together in marriage such persons as are of the said society, or when one of such persons is of such society, according to the rules and customs of the society to which they or either of them belong.‡

III. *Restriction as to Marriage of Minors.*

Any minister, or other person having authority to solemnize marriages, is liable to a penalty of three hundred dollars if he solemnize the marriage of any man under the age of twenty-one years or woman under the age of eighteen years without the consent of the parent or parents, guardian or guardians, or person or persons under whose care and government such minor may be. The consent of both parents, if living, is required. If there is no parent living the consent of the guardian or guardians, if any, must be had; and if there is no parent and no guardian living, then the consent of the person or persons under whose care and government the minor is, must be had. § The penalty may be sued for by the parent, guardian or person having charge of the minor; but the suit, to be effective, must be instituted within one year after the minor's marriage.*

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*See Revision of New Jersey, page 315, sections 2, 3, 4 and 5; and Pamphlet Laws of 1890, page 34.

† See Pamphlet Laws of 1890, page 439

‡ See Revision Supplement, page 443, section 1.

§ See Castner *vs.* Egbert, 7 Halsted's Reports, page 259. See also Revision of New Jersey, page 632, section 4. See also Pamphlet Laws of 1889, pages 139, 140.

If the person or persons whose consent is required is or are present at the marriage the consent may be given orally; otherwise the man under twenty-one years of age, or the woman under eighteen years of age, who applies to be married, must furnish to the minister or other officiating person a certificate of consent, in writing, signed by the person or persons whose consent is required. Such written consent must also be signed by a witness to the signatures of the person or persons giving consent. The witness must be of full age and should present himself before the minister or other officiating person at the time the certificate of consent is presented, and make oath or affirmation that he was present when the certificate of consent was signed, and that he thereupon affixed his name as a witness thereto. The oath or affirmation may be administered by the minister or other officiating person, and must be entered upon the back of the certificate of consent.†

If a minister, or other person authorized to solemnize marriages, suspects that a man applying to be married is under twenty-one years of age, or that a woman applying to be married is under eighteen years of age, it is his duty, unless a certificate of consent as above described is presented, either to refuse to solemnize the marriage or to require the suspected person to make oath or affirmation that he or she is of the full age of twenty-one years or eighteen years, according as the suspected person may be a man or woman, which oath or affirmation shall be in writing and entered upon the back of the certificate of marriage. The taking and entering of such oath or affirmation from a suspected person who furnishes no certificate of consent relieves the minister or other officiating person from all liability under the law.‡

Ministers and other persons authorized to solemnize marriages should not overlook the fact that, in the case of the marriage of a minor under the age of consent above stated, there are but three ways by which they can be relieved from liability for the penalty of three hundred dollars above mentioned, viz.: (*a*) By having the person or persons whose consent is required present at the marriage and orally giving their consent; (*b*) by the production of certificates of consent duly proven in the manner above mentioned; and (*c*) by requiring the oath or affirmation of a person who is suspected of being under the age of consent, and to whose marriage no consent is given or produced, that he or she is of the full age of consent required by law. Where no consent is given or produced as above stated, the mere declaration, not under oath or affirmation, of a man under twenty-one years of age, or of a woman under eighteen years of age, that he or she is of the full age of consent, though corroborated by any number of other persons, will furnish no defense to a suit for the penalty. Nor can the consent required be lawfully obtained in any other than one of the two ways above specified. The Supreme Court of this State has said: "Of the various ways in which parental consent might be proved, some are very safe and explicit, while others might lead into mistakes, or afford an opening for imposition. These various modes lying under consideration, legislative wisdom saw fit to adopt *only two forms of giving consent*, and to declare all other forms invalid." *

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* See Boswell *vs.* Robinson, 4 Vroom's Reports, page 273.

† Pamphlet Laws of 1889, pages 139, 140.

‡ Pamphlet Laws of 1889, pages 139, 140.

IV. Certifying Marriages.

After a marriage has been solemnized it is the duty of the minister, or other officiating person, within thirty days thereafter, to prepare a certificate of the marriage and transmit it to the Registrar of Vital Statistics, if there be such officer, and if not, then to the Clerk of the city, borough, town or other municipal government in which the marriage occurred; and in any township, every such certificate should be transmitted to the Assessor thereof, or if there be no Assessor in office, then to the Township Clerk. In case the marriage has been solemnized before a religious society, according to its rules, the certificate should be prepared and transmitted by the clerk or keeper of the minutes of such society. The certificate should set forth the name, age, parentage, birthplace, occupation and residence of each of the persons married, the time and place of the marriage, the condition of each of the persons married, whether single or widowed, the name of the minister or person by whom, or society before which, the marriage was solemnized, and the names and residences of the witnesses. The penalty for failure to transmit such certificate within the thirty days is twenty dollars.* The penalty for making a false certificate is a fine not exceeding one hundred dollars or imprisonment in the county jail for a period not exceeding three months, or both, at the discretion of the court.† Blank forms of certificates are required to be prepared by the State Bureau of Vital Statistics, and are furnished free to ministers and other persons authorized to solemnize marriages, by the Registrars and Clerks of cities, boroughs and towns, and the Assessors of townships.‡ Local Boards of Health also have the power, by ordinance, to compel the return of certificates of marriages.§

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* See Wyckoff *vs.* Boggs, 2 Halsted's Reports, page 139.

It is always wise to have present one or more witnesses to a marriage other than the contracting parties and the minister or person who solemnizes the marriage; but the law does not require the attendance of any such witness except in the case of the marriage of a man under twenty-one years of age, or of a woman under eighteen years of age, where no certificate of consent is produced. In such case, as above stated, the person or persons whose consent is required *must be present*, and give consent to the marriage. When such consent is given, the minister, or other person solemnizing the marriage, should for his own protection state on the blank certificate of marriage, as witnesses thereto, the name or names of the persons giving the consent, and add thereto the fact that he or they gave such consent. The certificate will thus carry with it the record of the presence at the marriage of such witnesses and their consent as required by law.

When a certificate of consent is produced, it must be proven as above stated by the oath or affirmation of the witness thereto. It is not necessary that such witness should be present at the marriage. The certificate of consent, with the proof thereof, should be fully copied by the minister or other officiating person in a book kept by him for that purpose, and then should be annexed to the certificate of marriage and returned with it to the Registrar or Clerk or Assessor of the city, borough, town or township in which the marriage occurred, to the end that the same may be forwarded to the State Bureau of Vital Statistics.‖ The advantage of preserving a copy of the certificate of consent is, that in case of the loss of the original, in transit, its contents may be proven by the production of the copy.

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* See Pamphlet Laws of 1888, page 52, sections 1, 4.

† See Pamphlet Laws of 1888, page 59, section 11.

‡ See Pamphlet Laws of 1888, page 61, section 14.

§ See Pamphlet Laws of 1887, page 85, section 12.

‖ See Pamphlet Laws of 1889, page 140, section 2.

FORMS OF MARRIAGE RETURN AND OF CERTIFICATE OF CONSENT TO MARRIAGE OF MINORS AS REQUIRED BY THIS STATE.

MARRIAGE RETURN.

See Penalty for Non-Report Within 30 Days.

Use Ink, and WRITE PLAINLY, especially names.

1. Full Name of Husband..
(If Colored, so state.)
Place of Residence..
(If in city, give name, street and number; if not, give township and county.)
2. Age..............years..............months. Number of his Marriage....................
3. Occupation.................................... Country of Birth..............................
4. Name of Father.............................. Country of Birth..............................
5. Maiden Name of Mother.................. Country of Birth..............................

1. Full Maiden Name of Wife............. Country of Birth..............................
(If Colored, so state.)
2. Place of Residence..
(If in city, give name, street and number; if not, give township and county.)
3. Age, nearest birthday............... {If in any trade or business, so state.} ....
4. Last Name, if a Widow.................. Number of Bride's Marriage....................
5. Name of Father.............................. Country of Birth..............................
6. Maiden Name of Mother.................. Country of Birth..............................

1. Date (in full).........................18..... Place..............................
(City or township and county.)
2. In presence of {
....
(Be sure to have witnesses.)
....
(Add P. O. Addresses.)
3. Signature of Minister (what Church Pastor of) or Person Officiating..................

NOTE.—All the facts called for in this Blank are important, and should be accurately given.

(By Chapter XCII. of the Laws of 1889, it is provided that "If the person called upon to solemnize any marriage shall suspect that any male applying to be married is under the age of twenty-one years, or that any female applying to be married is under the age of eighteen years, and no consent of the parent or parents, guardian or guardians, or person or persons under whose care and government such male or female may be, shall be obtained as hereinbefore directed, he shall administer to such male or female, or both, as the case may require, an oath or affirmation that such male is of the full age of twenty-one years, and that such female is of the full age of eighteen years, which oath or affirmation shall be entered upon the back of the certificate of marriage required by law to be made by the person solemnizing such marriage, and shall be his justification should the parties so married, or either of them, deceive him as to his or her age." The following is the correct form of oath or affirmation to be administered in every such case):

I,................., the husband within named, do solemnly.................that I am of the full age of twenty-one years. (Swear or affirm.)

....
(Husband's signature.)

Subscribed and.........................before me this.................day of.........A. D. 18...
(Sworn to or affirmed.)

....
(Minister's or Magistrate's signature.)

I,..................., the wife within named, do solemnly..................that I am of the full age of eighteen years. (Swear or affirm.)

....
(Wife's signature.)

Subscribed and........................before me this.................day of.........A. D. 18...
(Sworn to or affirmed.)

....
(Minister's or Magistrate's signature.

NOTE.—The affiant should be sworn unless he alleges himself to be conscientiously scrupulous of taking an oath, in which case he may affirm.

NOTE FROM BUREAU OF VITAL STATISTICS, TRENTON.—All Blanks for Returns of Marriages are to be procured from, and, when filled, returned to, Clerks or Registrars of Cities, Township Assessors, &c., as provided by the law for the Registry of Marriages, Births and Deaths. Filing in the office of the County Clerks is never requisite. Where those performing the marriage ceremony average ten or more marriages each year, on application to the Bureau by postal, blanks will be sent direct.

CONSENT OF PARENTS OR GUARDIANS TO MARRIAGE OF MINOR.

(By Chapter XCII. of the Laws of 1889 it is enacted that "No Justice of the Peace, minister of the gospel, or other person having, or pretending to have, authority to join persons together in the holy bonds of matrimony, shall marry any male under the age of twenty-one years, or female under the age of eighteen years, unless the parent or parents, guardian or guardians, or person or persons under whose care and government such minor or minors shall be, be present and give consent thereto, or until the minor applying to be married, whether male or female, shall have produced a certificate of consent, in writing, under the hand of the parent or parents, guardian or guardians, or if such minor so applying to be married have no parent or guardian, then under the hand of the person or persons under whose care and government he or she may at that time be, and if any certificate be produced as aforesaid, the same shall be proved to be genuine by the oath or affirmation of at least one person, of full age and discretion, who was present at the signing of the same, and affixed his or her name as a witness thereto, which oath or affirmation may be administered by any Justice of the Peace, minister of the gospel, or other person authorized to solemnize marriages as aforesaid, and shall be entered upon the back of said certificate of consent."

The following is the proper form of certificate of consent to be used in every such case, with the proper form of oath or affirmation on the back hereof):

This is to Certify, That.........................., who have hereunto subscribed........... name..., do hereby consent that...................., who is...................................
(Name of Minor.) (My or our son, daughter or ward.)

and who is under the age of.........years, shall be united in marriage to..................
by any minister of the gospel or other person authorized by law to solemnize marriages.

Witness.........hand...this.......... ....day of.............................A. D. 18...

....

Signed in presence of ....

(Parent's and Guardian's signatures.)

....

NOTE.—The law above mentioned also provides that "Every Justice of the Peace, minister of the gospel, or other person having, or pretending to have, authority to join persons in marriage, who shall marry any minor or minors by virtue of a certificate of consent had and proved as above directed, shall register the same, or cause it to be registered, in a book by him to be kept for the purpose of registering marriages, and shall attach the original certificate of consent to the certificate of marriage by him required to be made, and shall transmit the same, with said certificate of marriage, to the officer to whom by law he is required to transmit the certificate of marriage, to the end that the same may be forwarded to and filed with the State Bureau of Vital Statistics."

It will be good and safe practice, in all cases where the male is under the age of twenty-one, or the female under the age of eighteen, even though the parents or guardians be present at the marriage ceremony, to have them sign the above certificate of consent, but it will not be necessary in such case to administer the oath or affirmation on the back of this certificate:

I,......................., the witness named within, do solemnly.......................that I am
(Swear or affirm.)
of the full age of twenty-one years; that I am personally acquainted with..............
the person... who subscribed the within Certificate of Consent; that I was present at the signing of the same, and affixed my name as a witness thereto, and that the names thereto subscribed are the genuine signatures of the said............................

....

(Affiant's signature.)

Subscribed and.......................before me this...........day of.............A. D. 18...
(Sworn or affirmed.)

....

(Minister's or Magistrate's signature.)

NOTE.—The affiant should be sworn unless he alleges himself to be conscientiously scrupulous of taking an oath, in which case he may affirm.

The return in cities is made to the City Clerk or the Registrar of Vital Statistics, if there be such officer, and in townships to the Assessor.

Reference to separation or divorce laws is made in order that all may understand that desertion or any other cause is not sufficient unless a court has so decided and certified in due form. The marriage act and contract involve high moral obligations, and are so solemn and far-reaching in results that those performing the ceremony should feel its high import and not thoughtlessly help to con-

summmate a union which means so much for persons, for the family, for the State. There is weighty importance for exactness as to all things relating to marriage, since so much of the welfare of society, personal happiness and prosperity and laws as to heirship and distribution of property depend thereupon. It is essential as to it as well as to births and deaths that there be no neglect of State registry, since the evidence may at any time be needed in pensions, in insurance, in proofs of inheritance, in legal cases, and since the statistics are needed for the study of social conditions. The statistics are also needed for those studies of population which are now recognized as essential to each county. The minister or other person neglecting to observe any of these laws may years after be liable for consequences resulting from the neglect. The laws are plain and easily carried out, and are essential to the good order of society. Blanks for certificates can always be had of the City Clerks or Assessors, or by addressing postal directly to State Bureau of Vital Statistics, Trenton, N. J., or this and all other circulars are furnished by addressing

EZRA M. HUNT, M.D.,
Sec'y and Med. Supt. S. V. S.

ANNEX TO CIRCULAR XLV.

OF THE

STATE BOARD OF HEALTH OF NEW JERSEY.

MEMORANDUM AS TO CHOLERA, FOR BOARDS OF HEALTH.

1. What are your provisions in case you have an actual case of cholera reported to you?

2. Have you a hospital or vacant house to transfer it to?

3. Have you places to transfer the well to in case patient cannot be removed?

4. Have you at hand a disinfecting corps who would put the house in the best sanitary condition, in those parts where the patient is not, and ready to cleanse his room when opportunity offers?

5. Have you any one who would take charge of a case, as nurse, and obey orders?

6. Have you a tent or small building at command for use?

7. Have you any form of metal ambulance and large tin chest for removal of effects of cholera patients?

8. Have you on hand a supply of disinfectants, and what?

9. Where can the poor get prescriptions for cholerine without charge?

Are you now having all lodgings, or other houses to which immigrants might come, watched?

Is your Inspector making quick visits to the fouler parts of the districts, and securing cleanliness in houses as well as outside? Have him put on file his report each day.

Have you distributed State Circular 45 as to cholera and what to do as to common cholerine?

Bear in mind that the one thing of most importance is to disinfect the discharges and to prevent them from coming in contact with anything except the vessel which holds them. Keep a disinfectant in it constantly. The patient, if kept in the room where taken sick, must be committed entirely to a good doctor and a good nurse, and all other communication cut off, if possible. For safety, remember that cleanliness, fresh air and sunlight are all important.

For disinfection, boiling water, chloride of lime and quicklime, recently slaked, are the best. Make the latter the same as whitewash or milk of lime. It can be used for stool or other disinfection. Use fresh whitewash on walls.

Corrosive sublimate is of much value for walls, floors, &c., but as it is poisonous it should be colored with bluing to prevent mistake. All details of treatment and many details of hygiene must be left with the doctor, aided by the Health Inspector.

If cholera is in your town, use no water or milk without boiling. Watch carefully all new arrivals of strangers in townships or villages, and find whether they are recent immigrants or have come in contact with cholera patients. If so, for a few days they should not mingle with others, and should be kept under observation. Where suspected cases occur at ferries, railroads, factories or to any persons away from home the following suggestions are of service:

A temporary place for isolation and detention should be provided in ferry-houses, railroad stations, factories, &c., for such as may be taken ill thereat, or while riding on ferryboats or railroads. This room should be easily reached and have a water-tight floor covered with oilcloth. Persons suffering from vomiting or purging should be placed in the room at once and the Health Board immediately notified. In it should be placed a barrel of disinfecting fluid (corrosive sublimate, one ounce to eight gallons of water, well stirred up and colored with indigo or bluing), to be used on floors, seats, for flushing closets and for wiping woodwork or soiled walls. Or use disinfectants (Circulars 45 and 64) and fresh whitewash everywhere.

All surfaces soiled with cholera discharges should be thoroughly scrubbed with the disinfectants, care being taken to permit none of the discharge to pass into cracks in the floors, or through them to the surface beneath.

The water-closets and urinals should be kept constantly and thoroughly cleansed and disinfected. Boards should inspect stations and all public buildings.

The floors of ferryboats, ferry-houses, railroad cars and depots should be scrubbed daily after thorough disinfection. They should not be swept until after thorough sprinkling with the disinfecting solution; and the sweepings should be disinfected again before being thrown into the sewer or river. (See Circulars 45, 64 and 44.)

As to powers of your Board and Health Code, refer to Circular 60, and to Chapter 68, Laws of 1887, Sections 24, 25, 26, 32, 35 and 21, and Chapter 218, Laws of 1892. Send for any circulars.

E. M. HUNT, M.D.,
Secretary.

Reprint 3.

(The following circular has been revised, and on account of its connection with cholera and disinfection, is here repeated.)

CIRCULAR XLIV.

OF THE

STATE BOARD OF HEALTH OF NEW JERSEY.

HOW TO PREVENT THE SPREAD OF SMALL-POX, SCARLET FEVER DIPHTHERIA AND OTHER COMMUNICABLE DISEASES.

(NOTES AS TO VACCINATION.)

These diseases are spread by infectious particles which pass from person to person, directly or by means of discharges (called secretions or excretions), or by clothing, furniture, or other surroundings. We seek to prevent this transfer chiefly as follows:

a. By avoiding contact as far as possible or proper.

b. By abundant supply of pure air and ventilation.

c. By removing all unnecessary materials which receive or absorb the infective particles.

d. By the most exact cleanliness of person and things.

e. By disinfectants.

We specify the diseases with which we have most to deal and the chief sources from which the particles are diffused:

f. Small-pox—from the pustules, chiefly of the skin.

g. Scarlet fever—from mouth, throat, nasal passages and skin.

h. Diphtheria—from the mouth, throat and nasal passages.

i. Measles—from the mouth, throat, nasal passages and skin.

j. Whooping-cough—the expulsive breath from the air passages; also, from the sputa or spittle.

k. Typhoid fever—the discharges from the bowels and perhaps constant exposure to other secretions and excretions from the patient.

l. Pulmonary tuberculosis is thought to be communicable by means of dried sputa, which, therefore, should be burned or disinfected while moist.

As to small-pox, its contagion is very diffusive, and continues for a long time in the scabs of the pustules.

Scarlet fever is probably conveyed by the peeling skin longer than by the breath, but it is not so diffusive as small-pox or measles.

Diphtheria is not communicable at long distances, except in very close rooms. The membrane itself is the most dangerous source of contagion, particles of which may be carried and impart the disease at almost any distance if there is not full exposure to air. The sputum, wet and dry, is dangerous.

Measles is very communicable, and probably more so because the cough tends to propel and diffuse the breath laden with infective particles.

The same is true of whooping-cough, and besides, the sputum or phlegm, when it becomes dry, helps to diffuse the infection, as the particles mingle with the air.

Typhoid fever seems chiefly to be communicated by the discharges, after they have undergone change by exposure to the air and to materials such as milk, which can absorb the particles, and when used convey it into the system. When typhoid fever prevails all drinking-water should be boiled.

It is true of this and of other contagions above named, that they *may pass into water or food, as well as air*, and be conveyed into the system by such means.

While these are the chief, they are not the only infections which may be conveyed.

Thus, typhus fever is directly conveyable through the breath or the eruption.

Cholera, like typhoid fever, is conveyable chiefly through the discharges. (See Circular 45, on Cholera.)

Yellow fever is conveyed chiefly through clothing or other surroundings.

There is a follicular form of sore throat, different from that of scarlet fever or diphtheria, which often seems to be communicated by near contact or inhalation of the breath. Direct breathing in of the breath of others is never healthy and should be guarded against, especially where there is sickness.

Mumps is communicable at a short distance.

Some forms of skin diseases are conveyed by contact. Persons with any form of sore eyes, or unnatural discharge of any kind, should not use a towel used by others. (See Circular 47.)

It is now believed that to some persons consumption may be communicable, where there is imperfect ventilation, or to some susceptible persons who are constantly brought in direct contact with the dried sputa of one sick with this malady.

Individual care and cleanliness go a great ways in preventing the catching and in reducing the severity of any disease.

Personal cleanliness, personal good habits and good health help to ward off many diseases.

We have selected the various diseases named because they are the chief ones to which so many are exposed, and which, therefore, most need guarding against.

We may name some general rules which apply with nearly equal force to all of these diseases:

1. When any one has sore throat, foul breath, or eruption, however slight, he should be kept apart from all persons, except an adult nurse or attendant, until it is known whether he has some one of the

communicable diseases. If there has been exposure to any communicable disease, special precaution should be used. Mild cases, just because they do not prevent moving about, often communicate these diseases. Scarlet fever does not, as a rule, occur sooner than six days, and diphtheria in from three to ten days. Small-pox and measles not sooner than twelve days. There should be early diagnosis of what the disease is by some skilled person, even when the attack is mild and does not require much subsequent attendance.

2. Every person suspected or known to be sick of small-pox, scarlet fever, diphtheria, measles, cholera, typhoid fever, &c., should be isolated from all other persons except necessary attendants. The garments of the patient and those of the attendants should be of such material as will admit of disinfection, boiling and washing. Persons entering or remaining in the room should not take off such garments as hats or coats or gloves and put them on again in the room, as they thus serve to enfold and convey infective particles. Persons hungry or fatigued, or without food in the stomach, are more susceptible to most diseases. Nurses should have occasional baths and be scrupulously clean, and, if compelled at any time to mingle with others, should first, after washing in some mild disinfectant, expose themselves a few moments to the open air. Finger-nails need great care. Close cutting of the hair and beard is often advisable. Women should have the hair covered by a cap; men, when nursing, especially in small-pox, should remove the whiskers. It is quite certain that the smaller domestic animals, as the dog and the cat, convey, and may even contract some of these diseases. They should never be allowed in the sick-room. No food or milk or water which has stood in the sick-room should be partaken of by others. These receive or absorb infective particles, and so convey disease. Dishes long in the room should be rinsed in some disinfecting fluid before removal.

3. The bed-room of a person sick with small-pox, scarlet fever, diphtheria, measles, &c., should be cleared of all unnecessary furniture, clothing or drapery, and of all kinds of bed or bedding that are not needed. Articles in the room when the sickness has fully begun, should not be removed to another room until they have been in the open air. Often it is best to remove the carpet, as rugs will answer and are more easily cleansed afterward. The room should never be less than 10x14, with an eight or ten-foot ceiling, and capable of having plenty of light admitted. It is better not to have the bed put

in the corner or against the walls. It is important that the windows be so located as to admit of good ventilation without draught on the patient. If a piece of board is placed under the length of the lower sash, so as to cause an opening between the lower and upper sash, or if there is at the top of the window a frame slanting toward the ceiling, or any other arrangement for letting in air and yet interrupting a direct or downward *draught*, much air can be admited without any current being felt. A temperature of 70° F. may be taken as a standard. Overheat and overmoisture make infective particles more active.

4. Discharges from the nose or the mouth, and from the throat or the lungs, should be received upon cloths or rags or soft paper, so as to be quickly burned, or into cups or vessels containing some one of the disinfectants hereinafter named. The mouth needs frequent cleansing in sickness. Handkerchiefs are convenient, but too often are left to become soiled, or to convey contagion. After they are soiled, at once put them in hot water or some disinfectant.

The discharges from the bowels and the bladder should be passed into vessels containing a pint of disinfectant, and without undue delay be buried at least one hundred feet from any well, and not over two feet in depth. When this is impracticable the disinfectant should be more plenty, and then the removal to the common sewer should be speedy.

The soiled bed or body linen or towels of the room should not be mingled with other soiled clothing, or put into the general wash or wait for the weekly washing, but should be covered over with a disinfecting fluid or promptly cleansed by hot water, and by the usual laundry methods.

5. No person who has recovered from small-pox, scarlet fever or diphtheria should mingle with others until there has been washing of the whole body and entire change of clothing. The time for return to society must be regulated by the physicians.

Two weeks after *complete* recovery from diphtheria or measles is usually sufficient. But by complete recovery we mean this lapse of time *after* all symptoms have disappeared. After small-pox or scarlet fever a longer period must elapse, since the skin is for some time separating its contaminated particles. From four to six weeks is the time generally named, but very much depends, as to time, upon the home cleanliness of the family and of the person.

When death has occurred from communicable disease the body should be washed with a chloride of lime or zinc or corrosive sublimate solution of double strength of that described under disinfectants, and then be wrapped in a sheet wet with same. Shavings or "excelsior," moistened with a disinfectant, may be placed under the body. In no case should the body be exposed to view. In most cases it is desirable to avoid a public funeral, and especially the attendance of children. Much depends on the skill and knowledge of the undertaker. (See Circular 67.)

Disinfection of House and Surroundings.—The first requisite is the most thorough exposure of the room to air, unless it is in such very close proximity to other buildings as that it is best to *fumigate first.*

The following directions will guide as to materials and methods of disinfection:

Disinfectants to be Employed.—1. Roll sulphur (brimstone) or chlorine gas for fumigation.

2. Chloride of lime—Dissolve from four to five ounces of best quality in one gallon of pure wate.

3. Sulphate of iron (copperas) dissolved in water in the proportion of one and a half pounds to the gallon, for soil, sewers, &c.

4. Zinc solution—Sulphate of zinc and common salt, dissolved together in water in the proportion of four ounces sulphate and two ounces salt to the gallon, for clothing, bed-linen, &c.

5. Thymol solution—Two drachms of thymol (crystals) dissolved in ten drachms of alcohol, twenty drachms of glycerine and one gallon of hot water.

6. Solution of corrosive sublimate—One ounce to eight gallons of water, with a little bluing or aniline for coloring, and in a special wooden or earthen vessel.

7. Commercial sulphuric acid—One pint to eight gallons of water.

8. Carbolic acid solution—Two to five per cent., or Squibb's No. 1 diluted.

9. Lime, plaster, charcoal, dry earth, sifted ashes—All these have value, chiefly to be tested by the rapidity with which they correct odors. Fresh-slaked lime should be scattered in all places of foul odor. This has high disinfecting value and may be used for stool

vessels where contents are not to be thrown for many days into small pipes or drains. Lime, charcoal or plaster may be scattered over heaps emitting foul odors. Calx powder is made by pounding one bushel of dry, fresh charcoal and mixing it with two bushels of slaked lime, and is of great practical use.

How to use Disinfectants in the Sick-Room.—The most available agents are fresh air and cleanliness. The clothing, towels, bed-linen, &c., should at once, on removal from the patient, and before they are taken from the room, be placed in a pail or tub of the zinc solution, *boiling hot* if possible. Chloride of lime answers equally as well for white articles.

Unnecessary furniture—especially that which is stuffed—carpets and hangings, when possible, should be removed from the room at the outset; otherwise they should remain for subsequent fumigation and treatment.

All discharges should either be received in vessels containing a disinfecting solution, or, when this is impracticable, should be immediately covered therewith. All vessels used about the patient should be cleansed with the same solution.

One-half pound of sulphate of iron (copperas or green vitriol), or one ounce of sulphate of zinc (white vitriol), or one ounce of sulphate of copper (blue vitriol), or one ounce chloride of zinc (butter of zinc), or one ounce of chloride of lime (bleaching powder), put to a quart of water, will answer for this purpose.

Fumigation with sulphur is a practical method for disinfecting the house. Moisture, either by means of sprinkling or by water kept hot enough to give off vapor, is necessary to secure its effect. A pint or more of water should be evaporated with every three pounds of sulphur. The rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding and other articles which cannot be treated with chloride or other solutions should be opened and exposed during fumigation. Close the rooms as tightly as possible, place the sulphur in iron pans supported upon bricks placed in wash-tubs containing a little hot water, and so as to prevent danger from specks of burning sulphur. Set it on fire by hot coals, or with the aid of a tablespoonful of alcohol or saltpeter, and allow the room to remain closed for twelve hours. For a room about ten feet square and ten feet height of ceiling, at least three pounds of sulphur should be used; for larger rooms, proportionately increased quantities, placed at two or three points. For utensils and for quick disinfection the quick-lighting sulphur cone is convenient.

To disinfect an ordinary room with chlorine gas—Having tightly closed all the openings of the room, the room being unoccupied, place from half a pound to a pound of chloride of lime in a wide basin, stir it up with a quarter of a pint of water and pour into the mixture a pint of hydrochloric (muriatic) or dilute sulphuric acid. This is enough for room of size above named. The person who has to mix these materials should be cautioned not to inhale the vapors, which are rapidly evolved. Here moisture is also needed.

Cellars, yards, stables, gutters, privies, cesspools, water-closets, drains, sewers, &c., should be frequently and liberally treated with chloride of lime or copperas solution. The copperas solution is easily kept prepared by hanging a perforated box or basket containing about sixty pounds of copperas in a barrel of water, or by dissolving in hot water a few pounds of copperas. The zinc solution is still better.

Corrosive sublimate is cheap and has excellent disinfectant properties. It is valuable for the washing of hands, of walls, of furniture, but does not readily act on heaps or lumps of organic matter. (See in full, Health Inspectors' Guide, Circular 75.)

The vessel containing it should be marked "poison."

Sulphuric acid has been found very effective for sprinkling and general disinfection.

Where a disinfectant wash of pleasant odor is desired for common use by the person sick, or the attendant, the thymol solution, derived from thyme and some other plants, answers a good purpose.

We have not especially referred to carbolic acid and other phenol compounds, because, while useful, they are not preferable to those already named. A five per cent. solution of carbolic acid is good, but have its strength warranted.

Body and Bed Clothing, &c.—It is often *best* to burn articles which have been in contact with persons sick with contagious or infectious diseases, and especially if the disease be small-pox. Articles too valuable to be destroyed should be treated as follows:

(*a*) Cotton, linen, flannels, blankets, &c., should be treated with the boiling-hot zinc solution. Sulphate of copper solution may be used, as also chloride of lime, for white clothing, for soaking awhile and wringing out before the use of hot water for washing. Introduce piece by piece, secure thorough wetting and boil for at least half an hour.

(*b*) Heavy woolen clothing, silks, furs, stuffed bed-covers, beds and other articles which cannot be treated with the chloride or other solutions should be hung in the room during fumigation, their surfaces thoroughly exposed, and pockets being turned inside out. Afterwards they should be hung in the open air, beaten and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, &c., should be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten.

After fumigation it is desirable to cleanse all woodwork with soft soap and hot water, to thoroughly brush hard or papered walls and to whitewash the rest. A thorough general house-cleaning is desirable. (For washing of walls, &c., in infected rooms, see Inspectors' Guide, Circular 75.)

The question whether beds can be safely fumigated and re-used will depend upon the amount of soiling or use. All things which are found not capable of being thoroughly cleansed should be at once burned. As contagions are often stored up and kept over because of imperfect airing and cleansing, safety depends upon what has been done after the cases have ceased.

In these directions it is not claimed that in every case of communicable disease there is to be so much labor and destruction. But the most perfect methods are presented as models, to be varied, if proper, under the advice of the physician, who also thus needs to be reminded of what *thorough disinfection means*. There is much *make-believe disinfection.*

SPECIAL DIRECTIONS AS TO VACCINATION FOR THE PREVENTION OF SMALL-POX.

With the present facilities for travel and the thoroughfare character of this State there is no reasonable expectancy that any person will reach the age of twenty-one without great risk of small-pox, unless the disease is prevented by vaccination. The person who runs this risk not only endangers his own life and comfort, but imperils others to a degree not justifiable.

By the provisions of the Health law (see Circular 60) all School Boards are authorized to vaccinate, at public expense, any pupils attending school who are unable to procure vaccination.

All Local Health Boards need to see to it that vaccination is recommended, as well as rapid isolation of cases secured, if any occur. The cost of local epidemics of small-pox is very great, besides the peril to life and public health. The prevention of the disease is within the range and duty of your control. All our Local Health Boards and School Boards should co-operate in influence and provision for more general vaccination, and for re-vaccination of persons who have not been vaccinated since full growth. The heads of large manufacturing establishments need to attend to it, both in the interest of capital and labor.

Bear in mind and act upon the following suggestions:

I. Let every parent see to it that each child is vaccinated before one year of age, and sooner, if possible.

II. Let no teacher or child be admitted to a public school without vaccination.

III. Let provision be made by School Trustees and Boards of Health for free vaccination for such as need this provision.

IV. Would it not be well, some day, just before the vacation, to have a *vaccination day*, on which all scholars could be invited to be vaccinated by their physicians, at home, or, by some public arrangement, at the school building?

V. Do not concern yourself about the kind of vaccine or lymph used any more than you would about the source of medicine you take, but hold the physician responsible therefor. Have the sore examined and take a certificate from the vaccinator that, in his judgment, you are successfully vaccinated, the date being given.

VI. Have vaccination repeated or retried after the age of fourteen. Most persons, if fully vaccinated the first time, will have but little result from the repetition, but it is advisable to have this additional assurance of safety.

VII. If small-pox or varioloid occurs in your house, do not attempt concealment. At once send for your physician and do as he advises you, or notify the Board of Health. Have every member of the family vaccinated. By some means prevent the possibility of persons coming in unawares. If you know of any person who has been exposed, send him word so that he may be vaccinated.

VIII. Where there are factories, the Superintendent should advise or direct all the employes to be vaccinated.

Most of our physicians have full confidence in humanized vaccine lymph, which is easily secured. *Vaccine lymph directly from the calf* is preferred by those who have any fear of the conveyance of other diseases through humanized lymph—a fear that is greatly magnified in the popular mind. It is, nevertheless, due that all have their preference, and that where vaccination is insisted upon as a condition of school attendance, bovine lymph be used, if desired. Many physicians prefer to use this. The New York City Board of Health, 301 Mott street, New York, furnishes it daily by mail. H. A. Martin & Sons send it direct from their herd, Roxbury Station, Boston, Mass. Dr. E. L. Griffin, Fond du Lac, Wis., is prompt in remittal. Ready supplies can also be had from Prof. Law, Ithaca, New York, or Dr. H. M. Alexander, Lancaster, Pa. The price per point is about fifteen cents, and less in larger quantities. There is reason to believe that some is sold for bovine lymph which is not such, and that there is a failure in effect because of age and imperfect keeping. Rely on direct supply from producers.

We urge upon all physicians great exactness in selecting lymph, and upon the people protection from the disease. Its outbreak every few years is not a proof of epidemic tendency. The periodicity rather occurs because, as soon as years enough have passed after an epidemic, a younger product of children is out in public school life. Thus the susceptible material becomes so abundant as to insure extension if a single case is introduced from another section. Then there is an outbreak of small-pox and vaccination, of which the former has the start. Would it not be better if, somehow, the young population could be systematically protected? Let our various communities and Local Boards secure this, not only under present threatenings, but as a wise preventive measure.

Small-pox is the one contagious disease which ought never to occur, and which would forever cease if the preventive methods now well understood could be enforced. Every case is the result of public or personal imprudence. Where one has been exposed, unless there has been recent vaccination, he or she should be at once vaccinated. If this has been neglected it should be done, even if there has been neglect several days after exposure. It is not certain but that thorough vaccination, even when too late to prevent an attack, mitigates the severity of the secondary fever.

GENERAL PREVENTIVE MEASURES.

All contagious diseases should be promptly reported to the Board of Health, since public safety requires it, especially in cities, and no public use is made of the fact, save where there is great danger of an epidemic.

Every Local Board should have its executive officer, who should know how to stop the spread of the fire before it has attained headway. We urge upon all Local Boards the prevention of small-pox, scarlet fever, diphtheria and other preventable diseases. (See Special Circular 77, as to Diphtheria.)

To pursue a disease, in order to stop it, is often a duty; to get ahead of it, both a privilege and a duty, and very often possible. To prevent is to anticipate, to go before; and Health Boards, as well as individuals, may thus be of great service. Afterthought is sometimes good—forethought is better.

When a case of contagious disease occurs in your district do the right thing promptly, and do not waste the first week in consultations.

While it cannot be claimed that this or that kind of filth can account for the outbreak of every particular or specific disease, we do know *that cleanliness* of person or of surroundings is a great preventive or check to contagions.

Pure air, pure water, pure homes, pure soils, pure persons and pure surrounding are the surest safeguards against disease of every kind. Where an epidemic occurs in any locality it may here and there alight upon those whose homes are in good sanitary condition. But it is wonderful to see how general is the rule that pestilences have their choice of persons and places, and how uniformly those who can furnish the most insanitary conditions are surest to be visited. Malignancy is often in direct proportion to uncleanliness and filth, or to errors in methods for the disposal of decayable material.

Secure dryness for every part of your dwelling, and proper drainage, fresh air and sunlight.

Examine the cellar or basement and see that it is dry and clean, with whitewashed walls, with no concealed wells or cesspools, or decaying vegetables. Turn *all* its contents out-of-doors once a year, including barrels, boxes, &c.

See that all house soil-pipes and connections are properly trapped and ventilated. Guard against sewer air from the outside cesspool or sewer, by a trap with an intervening opening to the air between it and the house. See, also, that the house system has a ventilating opening on the roof.

Have all garbage frequently removed. Decomposing heaps of animal or vegetable matter near the dwelling are always hazardous. Precaution prevents the spread of disease, and is better than fear and panic, which kill many and do no good.

If wells are used for drinking-water their surroundings should be perfectly clean, no vessels being rinsed by them nor any slop-water thrown on the ground near them; nor should cesspools or privies be located within a hundred feet. (See Circular 53.)

If a cistern is used it should be cleaned each year or oftener.

If at any time the odor of water becomes bad, until you have ascertained the cause do not use it without boiling.

If individuals and Local Boards only recognize the conditions under which communicable diseases occur and spread, and, when they do occur, act promptly and intelligently, it is surprising how life is saved, disease diminished and epidemics prevented.

For copies of all circulars address E. M. Hunt, M.D., Secretary, Trenton, N.J.

For lack of space, Circular Letter H. as to Railroads, and two or three other brief circulars referred to in this report, are not reprinted here, but can be had on application by postal.

LAWS.

There is need of but little addition to our sanitary jurisprudence. As new occasion arises, no doubt other legislation will be furnished.

Lawyers have now come to recognize the various State acts as most important, and we are kindly aided by them in suggestions. It is very gratifying to have the testimony of able lawyers as to the present adaptability of the State laws, and to find that the higher courts support these laws except where Local Boards misapprehend or misapply them, which is rarely the case. An able legal committee now watches the needs of the State as to legislation, and appreciates the high importance of well-defined powers and their legitimate exercise. The principle that summary proceeding and police measures apply to the protection of the public health from nuisances is now distinctly ruled by our courts.

We draw special attention to the fact that by chapter 213, Laws of 1892, all powers in section 12 of the chief health law of the State, namely, chapter 68, Laws of 1887, were extended so as to include all Township Boards.

The chief health laws are given in Circular 60. Those passed by the last Legislature are as follows:

LAWS OF 1892.

Chapter XXXIX.—An act concerning the levying of assessments for sewers, approved March eighth, one thousand eight hundred and ninety-two.

Chapter LXXI.—An act to repeal an act entitled "A supplement to an act entitled 'An act to establish in this State, Boards of Health and a Bureau of Vital Statistics, and to define their respective powers and duties,'" approved March thirty-first, one thousand eight hundred and eighty-seven, which supplement was approved June tenth, one thousand eight hundred and ninety.

Chapter CIV.—A supplement to an act entitled "An act providing for the sewerage in and from certain towns in the State," approved April twentieth, one thousand eight hundred and eighty-six.

Chapter CXCI.—An act to regulate the practice of midwifery.

Chapter CCXIII.—A further supplement to an act entitled "An act to establish in this State, Boards of Health and a Bureau of Vital Statistics, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven.

Chapter CCXVI.—An act to amend an act entitled "An act to secure in this State, the certification of marriages, births and deaths, and of the vital facts relating thereto, and to provide for the record thereof," approved February fifteenth, one thousand eight hundred and eighty-eight.

Chapter CCXVIII.—A supplement to an act entitled "An act to establish in this State, Boards of Health, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven.

Chapter CCLVI.—An act authorizing the construction of sewers and drains in incorporated boroughs, approved April seventh, one thousand eight hundred and ninety-two.

Chapter CCLXXXVIII.—An act to allow towns, villages or other municipal corporations to acquire and use lands or real estate in an adjoining township or other municipal corporation for use for the construction of a sewage receptacle for sewage disposal works, approved April ninth, one thousand eight hundred and ninety-two.

REPORT

OF THE

BUREAU OF VITAL STATISTICS

OF THE

STATE OF NEW JERSEY,

FOR THE

Statistical Year from July 1st, 1891, to July 1st, 1892.

WITH LOCALITY, POPULATION, VITAL RECORDS
AND CLIMATOLOGY.

By EZRA M. HUNT. M.D., D.Sc.,
Secretary and Medical Superintendent of Vital Statistics.

REPORT ON VITAL STATISTICS.

BY EZRA M. HUNT, M.D., D.SC., MED. SUPT. OF VITAL STATISTICS.

INTRODUCTION.

It has long been recognized by students, both in hygiene and medicine, that conditions of sickness and disease, of vitality and mortality, must find expression in figures. There is no criterion of health so definite as the number of cases of invalidity, sickness and death, as proportioned to age, sex, conditions and the number of persons with whom we have to deal. The essential nature of such records first became evident as to armies. In the English army, for instance, the early statistical reports of Tulloch, Marsall and Balfour illustrated the importance of accurate figures. The importance of such records, as applied to civil life, became so evident that long before any general sanitary movement took place in England, the Registrar-General's office, in 1838, began its register of marriages, births and deaths. Since then, statistics have been far more widely applied for the record of various social and economic conditions, so that it has been well said that the advanced civilization of a nation can be quite fairly estimated by the extent and accuracy by which it studies and collects statistics. Of all these the most fundamental are vital statistics, since these define the actual conditions of the most material resources of a nation—its people.

Hence, Parkes says: "The fact that in modern times the subject of hygiene generally and state medicine in particular, has commenced to attract so much the public attention, is undoubtedly owing to the application of statistics to public health."

POPULATION STATISTICS.

AN ANALYSIS OF NATIONAL CENSUS AS BEARING ON SANITARY AND SOCIAL CONDITIONS IN NEW JERSEY.

In the last report (fifteenth), pages 357–373, in an article on "The Census and Comparative Facts as Related to Vital Statistics," we gave some facts derived from the last census. At the time we were not able to secure some important details as to parentage, families, &c. These are now at hand and are selected from a mass of other statistics and added in order to give facility in comparative study of social conditions as bearing on health. They will be found in many respects worthy of attention. Thus, for instance, in referring to families in our largest cities, while Camden has 4.72 persons on an average dwelling in a house, Trenton has 5.03, Paterson 7.91, Jersey City 8.78 and Hoboken 12.80.

Such contrasts are not without their bearing and indicate the need of similar studies in other directions. Density of population is most important as relating to the causes and progress of disease. The same is true as to nationality, parentage, number of tenements and various other items that concern the welfare of the whole people.

The following tables give the general distribution of population by sex, native and foreign born, white and colored, subdivided as to native and foreign, with a further subdivision under native white with regard to native and foreign parentage:

STATES.	Total population.	SEX.		NATIVE AND FOREIGN BORN.	
		Male.	Female.	Native.	Foreign.
New Jersey	1,444,933	720,819	724,114	1,115,958	328,975

STATES.	Aggregate white.	NATIVE WHITE. Total.	Native parents.	Foreign parents.	Foreign white.	Total colored.*
New Jersey	1,396,581	1,068,596	696,718	371,878	327,985	48,352

*By "colored" is meant not only persons of African descent but also Chinese, Japanese, and civilized Indians.

The following tables show the aggregate population and the number of males and females returned at each census since 1850, together with the number and per cent. of increase during each decade:

STATE AND CENSUS YEAR.	AGREGATE POPULATION.		
		Increase.	
	Total.	Number.	Per cent.
New Jersey—			
1890	1,444,933	313,817	27.74
1880	1,131,116	225,020	24.83
1870	906,096	234,061	34.83
1860	672,035	182,480	37.27
1850	489,555	116,249	31.14

STATE AND CENSUS YEARS.	MALES.			FEMALES.		
		Increase.			Increase.	
	Total.	Number.	Per cent.	Total.	Number.	Per cent.
New Jersey—						
1890	720,819	160,897	28.74	724,114	152,920	26.77
1880	559,922	110,250	24.52	571,194	114,770	25.15
1870	449,672	114,621	34.21	456,424	119,440	35.44
1860	335,051	89,705	36.56	336,984	92,775	37.99
1850	245,346	57,208	30.41	244,209	59,041	31.89

A further classification as regards native and foreign born, and white and colored, at each of the last five censuses, together with the number and per cent. of increase during each decade, is given in the following tables:

CENSUS YEARS.	NATIVE BORN			FOREIGN BORN.		
	Total.	Increase.		Total.	Increase.	
		Number.	Per cent.		Number.	Per cent.
New Jersey—						
1890	1,115,958	206,542	22.71	328,975	107,275	48.39
1880	909,416	192,263	26.81	221,700	32,757	17.34
1870	717,153	167,908	30.57	188,943	66,153	53.87
1860	549,245	119,638	27.85	122,790	62,842	104.83
1850	429,607	....	....	59,948	....	....

CENSUS YEARS.	WHITE.			COLORED.		
	Total.	Increase.		Total.	Increase.	
		Number.	Per cent.		Number.	Per cent.
New Jersey—						
1890	1,396,581	304,564	27.89	48,352	9,253	23.67
1880	1,092,017	216,610	24.74	39,099	8,410	27.40
1870	875,417	228,708	35.37	30,689	5,353	21.13
1860	646,699	181,190	38.92	25,336	1,290	5.36
1850	465,509	113,921	32.40	24,046	2,328	10.72

In the State of New Jersey the numerical increase, in the number of native-born persons, is larger than in 1880, while the percentage of increase is less.

In the States of New Jersey and Pennsylvania the percentage of increase of the colored population is less than in 1880, but the numerical increase is greater. The following table shows the distribution of the population at each census by percentages:

CENSUS YEARS.	SEX.		NATIVE AND FOREIGN BORN.		COLOR.	
	Male.	Female.	Native	Foreign.	White.	Colored.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
New Jersey—						
1890	49.89	50.11	77.23	22.77	96 65	3.35
1880	49.50	50.50	80.40	19.60	96.54	3.46
1870	49.63	50.37	79.15	20.85	96.61	3.39
1860	49.86	50.14	81.73	18.27	96.23	3.77
1850	50 12	49.88	87.75	12.25	95.09	4.91

It will be seen by the above table that in New Jersey the females slightly predominate. In New Jersey 3.35 per cent. of the population is colored.

Prior to 1880 no separation of the white population was made as to native and foreign born; in 1880, however, the white population was classified as native white and foreign white, while in 1890 a further classification has been made for native white according to parentage. Under this classification native parentage includes all native white persons having both parents native born or one parent native born and one parent for whom the birthplace was returned as "unknown," as well as all cases where, for native white persons, the birthplace of both parents was reported as "unknown." Under foreign parentage are included all native white persons having one or both parents foreign born. The distribution of the population in 1890 on this basis, and in 1880 according to native and foreign white only, is indicated in the following table of percentages, the total population in each case being considered as 100 per cent.:

STATE.	1890.						1880.			
		NATIVE WHITE.								
	Total white.	Total.	Native parents.	Foreign parents.	Foreign white.	Total colored.	Total white.	Native white.	Foreign white.	Total colored.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent	per cent.
New Jersey...............	96.65	73.95	48.22	25.73	22.70	3 35	96.54	76.98	19.56	3.46

In New Jersey the foreign white population has increased from 19.56 in 1880 to 22.70 in 1890.

In the State of New Jersey the native white of foreign parentage represents 25.73 of the total population.

In the State of New York only 42.03 per cent. of the entire population are native white persons of native parents; in the State of New Jersey only 48.22 per cent. are of purely native stock, while in the State of Pennsylvania 61.58 per cent. of the total population are native white persons of native parents.

New Jersey, being in such proximity to very large cities in other States, and having such large cities of its own, will naturally increase in the ratio of its foreign population and of those of foreign-born parentage. We will need watchfulness as to overcrowding in all our chief cities.

TABLE GIVING THE POPULATION IN 1890 FOR EACH COUNTY IN THE STATE OF NEW JERSEY, CLASSIFIED AS TO COLOR, SEX AND GENERAL NATIVITY.

STATE AND COUNTIES.	Total population.	SEX.		NATIVE AND FOREIGN BORN.		Aggregate white.	NATIVE WHITE.			Foreign white.	Total colored.
		Male.	Female.	Native.	Foreign.		Total.	Native parents.	Foreign parents.		
Atlantic	28,836	14,307	14,529	24,100	4,736	26,548	21,848	17,714	4,134	4,700	2,288
Bergen	47,226	23,694	23,582	35,665	11,561	45,402	33,834	21,918	11,916	11,568	1,824
Burlington	58,528	28,933	29,595	53,970	4,558	55,886	51,341	44,427	6,914	4,545	2,642
Camden	87,687	43,562	44,125	75,762	11,925	80,151	68,324	52,252	16,072	11,827	7,536
Cape May	11,268	5,716	5,552	10,775	493	10,401	9,918	9,210	708	483	867
Cumberland	45,438	22,924	22,514	42,110	3,328	43,333	40,016	36,005	4,011	3,317	2,105
Essex	256,098	124,408	131,690	182,561	73,537	249,021	175,732	88,187	87,545	73,289	7,077
Gloucester	28,649	14,731	13,918	26,442	2,207	27,230	25,028	21,516	3,512	2,202	1,419
Hudson	275,126	139,319	135,807	177,523	97,603	272,470	175,113	63,131	111,982	97,357	2,656
Hunterdon	35,355	17,464	17,891	33,629	1,726	34,854	33,181	30,394	2,787	1,723	501
Mercer	79,978	40,653	39,325	63,484	16,494	76,452	60,015	42,215	17,800	16,437	3,526
Middlesex	61,754	32,127	29,627	45,728	16,026	60,090	44,092	28,295	15,797	15,998	1,664
Monmouth	69,128	34,540	34,588	61,845	7,283	64,025	56,794	47,386	9,408	7,231	5,103
Morris	54,101	26,476	27,625	45,063	9,038	53,131	44,113	33,367	10,746	9,018	970
Ocean	15,974	7,984	7,990	15,257	717	15,821	15,105	14,071	1,034	716	153
Passaic	105,046	52,176	52,870	65,278	39,768	103,852	64,163	30,374	33,789	39,689	1,194
Salem	25,151	12,792	12,359	23,742	1,409	22,340	20,933	19,224	1,709	1,407	2,811
Somerset	28,311	14,161	14,150	23,770	4,541	26,960	22,423	17,728	4,695	4,537	1,851
Sussex	22,259	11,199	11,060	21,377	882	22,125	21,243	19,974	1,269	882	134
Union	72,467	35,521	36,946	53,925	18,542	70,245	51,745	29,896	21,849	18,500	2,222
Warren	36,553	18,132	18,421	33,952	2,601	36,244	33,660	29,434	4,226	2,584	309
New Jersey	1,444,933	720,819	721,114	1,115,958	328,975	1,396.581	1,068,596	696,718	371,878	327,985	48,352

A FURTHER CLASSIFICATION BY SEX, GIVING THE DETAILS OF WHITE AND COLORED, BY COUNTIES.

STATE AND COUNTIES.	AGGREGATE WHITE.		NATIVE WHITE.						FOREIGN WHITE.		TOTAL COLORED.	
			Total.		Native Parents.		Foreign Parents					
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Atlantic	13,252	13,296	10,811	11,037	8,799	8,915	2,012	2,122	2,441	2,259	1,055	1,233
Bergen	22,827	22,575	16,683	17,181	10,705	11,213	5.978	5,968	6,144	5,394	867	957
Burlington	27,599	28,287	25,271	26,070	21,858	22,569	3,413	3,501	2,328	2,217	1,334	1,308
Camden	39,879	40,272	33,882	34,442	25,886	26,366	7,996	8,076	5,997	5,830	3,688	3,353
Cape May	5,310	5,091	5,047	4,866	4,688	4,522	359	344	263	225	406	461
Cumberland	21,867	21,466	20,128	19,888	18,112	17,893	2,016	1,995	1,739	1,578	1,057	1,048
Essex	121,149	127,872	85,223	90,509	42,652	45,535	42,571	44,974	35,926	37,363	3,259	3,818
Gloucester	13,920	13,810	12,699	12,829	10,939	10,577	1,760	1,752	1,221	981	811	608
Hudson	137,937	134,533	87,507	87,606	32,005	31,126	55,502	56,480	50,430	46,927	1,382	1,274
Hunterdon	17,207	17,647	16,236	16,895	14,908	15,486	1,328	1,409	971	752	257	244
Mercer	38,785	37,667	30,074	29,941	21,073	21,142	9,001	8,799	8,711	7,726	1,868	1,658
Middlesex	31,248	28,842	21,917	22,175	13,965	14,330	7,952	7,845	9,331	6,667	879	785
Monmouth	31,862	32,163	28,139	28,655	23,449	23,937	4,690	4,718	3,723	3,508	2,678	2,425
Morris	26 007	27,124	21,459	22,654	16,293	17,074	5,166	5,580	4,548	4,470	469	501
Ocean	7,909	7,912	7,578	7,527	7,077	6,994	501	533	331	385	75	78
Passaic	51,539	52,313	31,419	32,744	14,900	15,474	16,519	17,270	20,120	19,569	637	557
Salem	11,309	11,031	10,540	10,393	9,652	9,572	888	821	769	638	1,483	1,828
Somerset	13,473	13,487	10,935	11,488	8,604	9,124	2,331	2,364	2,538	1,999	683	663
Sussex	11,137	10,988	10,608	10,635	9,953	10,021	655	614	529	353	62	72
Union	34,554	35,691	25,101	26,641	14,290	15,606	10,814	11,035	9,450	9,050	967	1,255
Warren	17,969	18,275	16,542	17,118	14,444	14,990	2,098	2,128	1,427	1,157	163	146
New Jersey	696,789	699,842	527,802	540,794	344,252	352,466	183,550	188,328	168,987	159,048	24,080	24,272

The following table gives for each city, borough and village considered, the per cent. of native and foreign born of the total population in 1890 and in 1880, the per cent. of native and foreign born for the State, as a whole, being again presented for purposes of comparison:

STATE, CITIES, BOROUGHS AND VILLAGES.	1890.		1880.	
	Native born.	Foreign born.	Native born.	Foreign born.
	per cent.	per cent.	per cent.	per cent.
Atlantic City	88.82	11.18	90.18	9.82
Bayonne	64.86	35.14	65.75	34.25
Bridgeton	94.79	5.21	95.32	4.68
Camden	86.74	13.26	89.21	10.79
Elizabeth	70.52	29.48	73.13	26.87
Harrison	61.01	38.99	63.26	36.74
Hoboken	60.19	39.81	58.08	41.92
Jersey City	67.27	32.73	67.48	32.52
Millville	93.15	6.85	94.58	5.42
Morristown	80.66	19.34	81.40	18.60
Newark	69.44	30.56	70.46	29.54
New Brunswick	81.69	18.31	80.32	19.68
Orange	71.02	28.98	71.58	28.42
Passaic	59.09	40.91	65.78	34.22
Paterson	60.23	39.77	63.35	36.65
Perth Amboy	56.00	44.00	70.63	29.37
Phillipsburg	88.84	11.16	85.48	14.52
Plainfield	79.28	20.72	82.41	17.59
Trenton	75.55	24.45	80.88	19.12
Union	59.39	40.61	59.28	40.72
New Jersey	77.23	22.77	80.40	19.60

In New Jersey, Perth Amboy shows the largest per cent. of foreign-born population, having 44 per cent. in 1890, as against 29.37 per cent. in 1880. Passaic has 40.91 per cent., Union, 40.61 per cent., Hoboken, 39.81 per cent., Paterson, 39.77 per cent., Harrison, 38.99 per cent., Bayonne, 35.14 per cent., while Jersey City shows 32.73 per cent. in 1890, as against 32.52 per cent in 1880.

The whole number of persons of from 5 to 20 years, inclusive, classified by sex, native and foreign born, native white of native and foreign parents, foreign white, and colored, is as follows:

STATE, AGE AND SEX.	All classes.	Native born.	Foreign born.	Aggregate white.
New Jersey—				
5 to 17 years	376,238	343,891	32,347	364,551
Males	188,476	172,213	16,263	182,836
Females	187,762	171,678	16,084	181,715
18 to 20 years	88,754	73,566	15,188	85,246
Males	41 349	34,603	6,746	39,697
Females	47,405	38,963	8,442	45,549
Total 5 to 20 years	464,992	417,457	47,535	449,797
Males	229,825	206,816	23,009	222,533
Females	235,167	210,641	24,526	227,264

STATE, AGE AND SEX.	NATIVE WHITE.			Foreign white.	Total colored.
	Total	Native parents.	Foreign parents.		
New Jersey—					
5 to 17 years	332,248	188,583	143,665	32,303	11,687
Males	166,594	94,972	71,622	16,242	5,640
Females	165,654	93,611	72,043	16 061	6,047
18 to 20 years	70,148	39,399	30 749	15,098	3,508
Males	33,036	18,510	14,526	6,661	1,652
Females	37,112	20,889	16,223	8,437	1,856
Total 5 to 20 years	402,396	227,982	174,414	47,401	15,195
Males	199,630	113,482	86,148	22,903	7,292
Females	202,766	114,500	88,266	24,498	7,903

The following tables show the number of persons of these ages returned under the censuses of 1880 and 1890, together with the increase in number and per cent. during the decade:

STATE.	5 TO 17 YEARS, INCLUSIVE.				18 TO 20 YEARS, INCLUSIVE.	
	1890.	1880.	Increase.		1890.	1880.
			Number.	Per cent.		
New Jersey	376,238	316,421	59 817	18.90	88,754	70,322

STATE.	18 TO 20 YEARS, INCLUSIVE.		5 TO 20 YEARS, INCLUSIVE.			
	Increase.				Increase.	
	Number	Per cent.	1890.	1880.	Number.	Per cent.
New Jersey	18,432	26.21	464,992	386,743	78,249	20.23

The number of males returned as being of the ages 18 to 44 years, inclusive, which are the militia ages, and the number of males of 21 years of age and over, or of voting age, classified by native and foreign born, native white of native and foreign parents, foreign white, and colored, are presented as follows:

STATE, AGE AND SEX.	All classes.	Native born.	Foreign born	Aggregate white.
Militia ages, males 18 to 44 years, inclusive— New Jersey	313,683	218,112	95,571	301,741
Voting ages, males 21 years and over— New Jersey	413,530	268,483	145,047	398,966

STATE, AGE AND SEX.	NATIVE WHITE.			Foreign white.	Total colored.
	Total.	Native parents.	Foreign parents.		
Militia ages, males 18 to 44 years, inclusive— New Jersey	206,869	134,486	72,383	94,872	11,942
Voting ages, males 21 years and over— New Jersey	254,633	189,725	64,908	144,333	14,564

The table following shows the number of males returned as being of militia age for the State in 1890 and 1880, together with the number and per cent. of increase during the decade:

STATE.	MILITIA AGES, MALES 18 TO 44 YEARS, INCLUSIVE.			
	1890.	1880.	Increase.	
			Number.	Per cent.
New Jersey	313,683	230,054	83,629	36.35

In the table above the males 21 years of age and over, or those of voting age, are classified with regard to general nativity and color.

The table following gives the whole number of males of voting age in 1890 and in 1880, with the number and per cent. of increase during the decade:

STATE.	VOTING AGES, MALES 21 YEARS AND OVER.			
	1890.	1880.	Increase.	
			Number.	Per cent.
New Jersey	413,530	300 635	112,895	37.55

Of the States of New York, New Jersey and Pennsylvania, New Jersey shows the largest increase per cent. in the number of males of voting age, the increase in that State being 112,895, or 37.55 per cent. during the ten years. Pennsylvania shows an increase in the number of persons of voting age of 367,585, or 33.59 per cent., while the increase in New York is 360,898, or 25.62 per cent.

Considering the whole number of males of voting age as 100, the number of native born and foreign born making that total is expressed in percentages in the table following:

STATE.	MALES OF VOTING AGE.	
	Native born.	Foreign born.
	per cent.	per cent.
New Jersey	64.92	35 08

The number of aliens is further classified in regard to those who speak English and those who speak other languages. These results regarding citizenship are given in the following table:

STATE.	Foreign-born males 21 years and over.	ALIENS.			Naturalized.	First papers.	Unknown.
		Total.	Speak English.	Other languages.			
New Jersey	145,047	41,877	27,561	14,316	87,466	4,993	10,711

This is the first time that this information regarding citizenship of foreign-born adult males has been obtained as a part of the national decennial census. Taking the figures given in the table above and expressing them in percentages, the total number of foreign-born males 21 years of age and over being considered as 100, the results are as follows:

STATE.	Total aliens.	Naturalized.	First papers.	Unknown.
	per cent.	per cent.	per cent.	per cent.
New Jersey	28.87	60.30	3.44	7.39

In New Jersey, 41,877, or 28.87 per cent., are aliens.

Considering the total number of aliens as 100 and expressing them in percentages, the number who can speak English and those who speak other languages, the results are found as below:

STATE.	ALIENS.	
	Speak English.	Other languages.
	per cent.	per cent.
New Jersey	65.81	34.19

In New Jersey, 34.19 per cent. of the total number of aliens reported cannot speak the English language.

DWELLINGS AND FAMILIES.

The following tables present facts as to dwellings and families in New Jersey as given by various national censuses in the census of 1890:

TOTAL DWELLINGS AND PERSONS TO A DWELLING—1850 TO 1890.

[In 1860 and 1870 the total number of dwellings includes both occupied and unoccupied dwellings, while in 1850, 1880 and 1890 the total number of occupied dwellings only is reported. For 1850 and 1860 the number of dwellings is for the free population only, as at those censuses the dwellings of the slave population were not returned.]

STATE.	NUMBER OF DWELLINGS.					PERSONS TO A DWELLING.				
	1890.	1880.	1870.	1860.	1850.	1890.	1880.	1870.	1860.	1850.
New Jersey	247,342	190,403	155,936	116,353	81,064	5.84	5.94	5.81	5.78	6.04

EXCESS OF FAMILIES OVER DWELLINGS.

STATE.	1890.		1880.		1850.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
New Jersey	60,997	24.66	41,906	22.01	8,016	9.89

The tendency to decrease in the average size of family in thickly-settled communities is brought out very forcibly in the table following, which gives for cities having 25,000 inhabitants and upward in 1890 the total number of dwellings and families, the average number of persons to a dwelling and to a family, and for 95 of these cities comparisons as to average number with similar results for 1880. The figures for 1880 are taken from a table in the printed report of that census, giving for 100 principal cities statistics as to dwellings and families:

CITIES.	Total dwellings, 1890.	Total families, 1890.	Persons to a dwelling, 1890.	Persons to a dwelling, 1880.	Persons to a family, 1890.	Persons to a family, 1880.
Newark	23,296	38,906	7.81	7.26	4.67	4.81
Jersey City	18 562	34,434	8.78	8.59	4.73	5.04
Paterson	9,870	16,815	7.94	7.60	4.66	4.78
Camden	12,362	12,667	4 72	5.05	4.60	4.75
Trenton	11,428	11,901	5.03	5.85	4.83	5.47
Hoboken	3,411	9,413	12.80	11.50	4.64	4.62
Elizabeth	5,820	7,683	6.49	6.55	4.92	5.29

The next tables presented give the number of dwellings, classified according to persons to a dwelling, in detail, as follows:

PERSONS TO A DWELLING, IN DETAIL.

STATE.	One person.	Two persons.	Three persons.	Four persons.	Five persons.	Six persons.	Seven persons.
New Jersey	5,248	26,591	36,793	39,234	36,891	28,928	21,878

STATE.	Eight persons.	Nine persons.	Ten persons.	Eleven to fifteen persons.	Sixteen to twenty persons.	Twenty-one persons and over.
New Jersey	15,093	10,240	7,808	11,853	3,517	3,268

The following tables give the number of persons to a dwelling, in detail, for each city having 25,000 inhabitants or more:

PERSONS TO A DWELLING, IN DETAIL.

CITIES.	One person.	Two persons.	Three persons.	Four persons.	Five persons.	Six persons.	Seven persons.
Newark, N. J.	220	1,133	1,904	2,553	3,042	2,705	2,450
Jersey City, N. J.	190	876	1,511	2,007	2,323	2,099	1,827
Paterson, N. J	123	519	705	934	1,068	1,032	1,024
Camden, N. J	167	1,614	2,372	2,375	2,059	1,469	969
Trenton N. J.	169	1,412	2,034	2,102	1,877	1,416	956
Hoboken, N. J.	25	110	152	219	262	269	298
Elizabeth N. J.	58	376	613	764	858	770	626

CITIES.	Eight persons.	Nine persons.	Ten persons.	Eleven to fifteen persons.	Sixteen to twenty persons.	Twenty-one persons and over.
Newark, N. J.	1,906	1,583	1,259	2,962	959	620
Jersey City, N. J.	1,464	1,136	903	2,011	944	1,271
Paterson, N. J.	888	758	669	1,506	435	209
Camden, N. J.	612	334	220	147	18	6
Trenton, N. J.	641	345	230	210	25	11
Hoboken, N. J.	238	216	220	514	277	611
Elizabeth, N. J.	491	350	310	470	88	46

The results for the largest cities, that is, those having a population of 100,000 and over, may be further analyzed, as follows:

CITIES.	PERSONS TO A DWELLING.							
	One person.		Two to six persons.		Seven to ten persons.		Eleven persons and over.	
	Per cent. of dwellings.	Per cent. of population.	Per cent. of dwellings.	Per cent. of population.	Per cent. of dwellings.	Per cent. of population.	Per cent. of dwellings.	Per cent. of population.
Newark	0 94	0.12	48.67	27.29	30.90	32.58	19.49	40.01
Jersey City,	1.02	0.12	47.50	23.63	28.71	26.84	22.77	49.41

Table as to two cities of over 100,000 inhabitants. (Compare with other cities, Bulletin 19.)

CITIES.	Total dwellings.	DWELLINGS WITH				Total population.	POPULATION OF DWELLINGS WITH			
		One to ten persons.	Eleven to fifteen persons.	Sixteen to twenty persons.	Twenty-one persons and over.		One to ten persons.	Eleven to fifteen persons.	Sixteen to twenty persons.	Twenty-one persons and over.
Newark........	23,296	18,755	2,962	959	620	181,830	109,085	37,248	16,857	18,640
Jersey City....	18,562	14,336	2,011	944	1,271	163,003	82,467	25,328	16,757	38,351

PERSONS TO A FAMILY, IN DETAIL.

CITIES.	One person.	Two persons.	Three persons.	Four persons.	Five persons.	Six persons	Seven persons.
Newark..................................	919	5,579	7,290	7,188	6,422	4,402	3,057
Jersey City..............................	797	4,667	6,127	6,305	5,869	4,115	2,794
Paterson..................................	449	2,487	3,054	3 041	2,669	1,894	1,346
Camden..................................	206	1,758	2,513	2,464	2,092	1,447	940
Trenton..................................	213	1,666	2,241	2,208	1,907	1,419	936
Hoboken..................................	227	1,397	1,720	1,744	1,517	1,022	766
Elizabeth.................................	177	964	1,304	1,338	1,246	974	651

CITIES.	Eight persons.	Nine persons.	Ten persons.	Eleven to fifteen persons.	Sixteen to twenty persons.	Twenty-one persons and over.
Newark..	1,834	1,062	657	421	53	22
Jersey City....................................	1,727	937	634	388	43	31
Paterson..	858	513	319	153	22	10
Camden..	592	322	196	118	14	6
Trenton..	593	312	219	163	14	10
Hoboken..	473	260	193	79	11	4
Elizabeth	444	264	177	121	13	10

Taking the two cities having 100,000 inhabitants or more, we have the following tables of percentages:

CITIES.	PERSONS TO A FAMILY.							
	One person.		Two to six persons.		Seven to ten persons.		Eleven persons and over.	
	Per cent. of families.	Per cent. of population.	Per cent. of families.	Per cent. of population.	Per cent. of families.	Per cent. of population.	Per cent. of families.	Per cent. of population.
Newark	2.36	0.50	79.37	66.16	16.99	28.71	1.28	4.63
Jersey City	2.32	0.49	78.65	65.62	17.69	29.54	1.34	4.35

CITIES.	Total dwellings.	NUMBER OF DWELLINGS HAVING SPECIFIED NUMBER OF FAMILIES IN OUR TWO CITIES OF OVER 100,000 INHABITANTS.								Average number of families to a dwelling.
		One family.	Two families.	Three families.	Four families.	Five families.	Six families.	Seven to nine families.	Ten families and over.	
Newark	23,296	13,703	5,992	2,376	575	370	180	81	19	1.67
Jersey City	18,562	11,192	3,882	1,488	721	462	387	381	49	1.86

The careful student of statistics of population will, in these various tables, find many facts having important bearing on health and house provisions for the people.

OUTLINE HISTORY OF ASIATIC CHOLERA AND ITS NEW JERSEY HISTORY.

BY E. M. HUNT, M.D.

Among the many forms of intestinal disturbance of which we find record through all the ages it is quite difficult to determine when the first case of Asiatic cholera occurred. Those who are disposed to believe that there is nothing new under the sun see in the descriptions of Hippocrates, Celsus, Sydenham and others the same epidemic as we now meet. Suffice it to say that it was not until about 1817 that the attention of physicians in centers of medical learning was directed to what is now known as Asiatic cholera. In that year it broke out violently at Jessore, in the Indian Province of Bengal, at the time of one of the great fairs. We cannot do better than quote as to it from the condensed and excellent paper on cholera by Prof. Henry Hartshorne, M.D., as given just after the American epidemic of 1866:

"In August, 1817, Jessore was the birthplace of the first great migratory epidemic. Shortly after, in Calcutta, 36,000 were attacked in three months. At many military stations it was very severe. Roads were covered with dead and dying, unable to reach their homes. In November the grand army of the Marquis of Hastings was devastated by it. Of 90,000 men, in twelve days 9,000 had died. On marching the army across a river to dry and elevated ground the commander was relieved of this otherwise invincible enemy.

"In 1818 the Burman empire was invaded by cholera, and there and elsewhere in Asia its ravages were fearful. In 1819 150,000 died of it in the Presidency of Bombay. It also reached Mauritius, 20° S. latitude, 3,000 miles from any place before visited by it. The island of Bourbon was visited in 1820, as well as the Philippine islands. In 1821 Borneo and Java were affected, and a large Persian army was repulsed by it from before Bagdad, without a battle. In 1822 its limits were much narrowed and its destructiveness abated.

"India almost escaped in 1823, but China was ravaged by it; and it extended northwestward in that year to Orenbourg,* Russia, on the Ural, near the borders of Europe and Asia. In 1826 it passed the great wall of China in its northward progress, but almost left Western Asia. It re-appeared in Persia in 1829.

"Orenbourg was re-visited in that year, and the epidemic there lasted from August to near the end of February. This city had a population at that time of 11,000, of whom 6,000 were soldiers. Those first affected had no communication whatever with any infected place.

"The year 1831 saw the cholera in the north of Europe as far as Archangel, near the Arctic ocean, more than 64° N. latitude. It reached Warsaw in April, during an insurrection, and was very fatal. Hungary suffered from May to September, losing 100,000 of its population. In June St. Petersburg, and in September Moscow, were reached by the pestilence. Berlin had it also for three months and a half, beginning in August. Mecca was attacked during the visitation of throngs of pilgrims, in May; of 50,000 as many as 20,000 are said to have perished. In this year, while Hungary was infected, the Austrians surrounded Vienna by a double *cordon militaire*, but in vain. The disease began there in August and continued three months. The southern provinces of Austria and the Rhineland were exempt. Constantinople was affected by it, but not with very great severity. The Turkish government that year maintained no quarantine. Cairo suffered dreadfully in 1830–31, and so did Smyrna.

"Attacking Hamburg on the 11th of October, 1831, it was officially announced in Sunderland, England, October 26th. It had occurred in several cases in England months before. Three or four weeks later it appeared at Newcastle, and in December at Haddington, a Scottish town on the Tyne.

"Edinburgh and Glasgow first had cholera in January, 1832; London in February, Dublin and Paris in March. London then suffered but moderately; Paris terribly, especially in April and May; 20,000 deaths."

It reached North America on the 8th of June of the same year, as hereafter more fully noticed.

During all this period there was occasional cessation, but fresh epidemics from time to time re-appeared in India. It was so different in its type and so virulent in its effects, and extended over such vast areas, that it was easily singled out as a specific form of flux, and has ever since maintained the general symptoms which then characterized it.

About the year 1841 another great epidemic of cholera appeared in

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*Orenbourg is a border city of Russia.

India and China. It was not until 1847 and 1848 that it again entered Europe, ravaging Russia, Turkey, Germany, Great Britain and France, and appearing on this Western Continent in 1849. It was even more deadly than the former, especially in Great Britain and France.

It lingered sporadically in Europe and America until the great increase of 1854, but such was the diminution that it is usual to specify a "third great outbreak of cholera, which took place in the East in 1850 and entered Europe in 1853." Hartshorne speaks of it as follows:

> "In 1853 Persia had it severely; also some parts of Northern, Central and Southern Europe (Copenhagen, Hamburg, Berlin, Piedmont, Lyons, Paris and Southern Portugal). Before the end of the year it was again in New York, New Orleans and the West Indies. Mexico had been visited in the spring and through the summer.
>
> "The year 1854 was still more a cholera year in Europe and in this country. Scarcely any European state or kingdom was exempt. The French, English and Russian troops suffered from it much in the Crimea. Greece, Italy, Germany, France, Spain, Portugal, in short, all Europe was traversed by it; 150,000 died of it in France alone; in England and Wales, about 20,000. Newfoundland, on our side of the ocean, was reached for the first time in 1854. This was the year of the epidemic at Columbia, Lancaster county, Pa., so remarkable for the absence of some of the usual promotive conditions of cholera. Our great cities, however, did not suffer nearly so much as in 1849.
>
> "In 1855 the disease was widely spread in Europe, though not very malignant, except near the seat of war before Sebastopol. Egypt and Palestine had it also. In Switzerland, which had been slightly touched before, Basle, Geneva, Zurich and other places now suffered by it. The next year, 1856, still did not witness its withdrawal from Europe."

A fourth epidemic visited Europe again in 1865. It occurred especially in Arabia and Egypt in the spring of 1865, reaching Constantinople in June. It was not so severe in Europe as many former epidemics, although lighting with severity here and there in many countries. In Paris, in 1865, 6,383 deaths occurred. In the epidemic of 1848, so severe through Europe and in France, Paris escaped. Its chief outbreak here was in 1866, as hereafter detailed. In 1871 it again ravaged Russia. From 1871 to 1873 Hungary and Prussia lost over 500,000 persons. In 1873 there were 1,225 cases in Hamburg. In the same year it ravaged the Southern and Western States of our own country, its origin, whether from Europe, the West Indies or South America, being in dispute.

In 1884 there was another outbreak in Europe, which did not reach this country. It was especially severe in Naples, where 1,200 deaths occurred by the middle of September, and nearly 11,000 altogether in Italy. The outbreak was very severe in Marseilles and Toulon, but it did not spread generally through France. Most of the 5,000 deaths occurred in these two cities in June, July and August of that year. In Toulon, out of 80,000 inhabitants all but about 25,000 fled the city, many of whom came to Marseilles, where a similar stampede took place. In each case a sudden change of temperature caused great increase, and so led to flight.

The epidemic of 1892 had its start in Asia, where it had been watched with some interest for more than a year. It began there March 28th at the great Hudwar Fair of India, which, because of it, broke up on the 25th. We quote the following notice of it from a number of the *London Lancet* of July, 1892:

> "Although cholera is decreasing at Meshed, in Persia, the fatal attacks having fallen to some thirty-five a day, yet the disease has extended over a wider area, and has at last entered Russian territory in Europe. Passing in a westward direction from Meshed, a number of towns have at intervals been attacked in the direction of Astrabad; and still further westward the disease subsequently appeared at Abasabad, on the southern shore of the Caspian sea. But the disease also crossed the mountain frontier between Meshed and Russian Turkestan, making its appearance notably at Khaaka and Askabad. Then it followed the railway route, and has since been reported at Usumada, on the eastern shore of the Caspian. The passage across the Caspian from this point is not difficult to understand, and, as a matter of fact, the important port of Baku in European Russia, situated on the western coast of the Caspian, soon became attacked. Thus the southern portion of the Caspian sea has been invaded at three points, and not only so, but the disease would appear to have extended in a southwesterly direction from Baku towards the Turkish frontier, for the town of Shusha, in the province of Elizabetopol, is now also a seat of cholera. There is, further, the prevalence of cholera in Samarkand and Bokhara, in both of which Russo-Asiatic states a number of towns have been attacked, and between which and Russia in Europe there is a not unimportant traffic. No trustworthy statistics are as yet available as to attacks or fatality, but it is certain that in Russian territory there have been several hundred deaths from cholera. The town of Bokhara is said to have escaped, and its escape is

attributed to the advanced sanitary measures which have been steadily adopted there since last December, the action having been taken at the instigation of the resident Russian diplomatic agent. The immediate interest in this intelligence lies, for us, in the prospect of a European invasion of cholera. The route which the disease has taken is by no means a fresh one; and it is, besides, one that, by reason of its traditions as to Oriental plague in and about Astrakhan, is known to be one where the conditions favorable to the diffusion of cholera have long since abounded and still abound."

Having thus entered Russia it was at St. Petersburg early in August, and was announced as present in various provinces.

With the degraded emigration from that country through Germany it was easy to forecast that Middle Europe could not long escape. Indeed, about at the same time there were cases in Austria-Hungary, the province infected being Galicia. It was first known as at Hamburg, August 18th, but may have been there a little time before.

Just here, however, there is occasion to note another center, which for two or three months before had been attracting the attention of students of epidemiology. A severe and fatal disease had been prevailing in the suburbs of Paris, which was attributed to the excessive sewer contamination of the river Seine. It was called choleraic diarrhœa. One cannot now review the facts in evidence without being led to the belief that the disease was a true cholera. When the first cases of admitted cholera occurred in the city of Paris it was claimed that they were not the same as those in the suburbs, but the evidence seems to point strongly to their identity.

"The Seine, or Paris, epidemic began April 2d, as a violent outbreak at the overcrowded Nanterre prison and asylum, close to the Seine, before the epidemic had invaded Russia." This prison and asylum is constantly receiving the poorest classes from Paris and its suburbs.

"The disease spread in the suburbs north and west of Paris and extended to Havre (which is also on the Seine.)" It was uniformly spoken of as cholerine and not cholera, but on September 13th Dr. Brouardel stated before the Academy of Medicine that "the first cases of cholera occurred at Nanterre, near Paris, on April 2d, at Havre August 2d, at Hamburg August 11th."

"In the suburbs there were 24 deaths in April, 14 in May, 76 in June, 299 in July, 123 in August, and from September 1st to 14th, 173 deaths. This gives a total of 709 deaths in the suburbs of Paris, but within the department of the Seine; for it must be noticed that there are other districts that may also be considered suburbs of Paris, such as Sarcelles, where the Belgian bricklayers from Jumet contracted cholera, which are not included in these statistics because they form part of another department or county. In Paris—that is, within the fortifications or walls of Paris—there was one death attributed to cholera in April, and this occurred on the 21st. In May there were 10 deaths, in June 19, in July 83 and in August 229. Towards the end of August the cholera had greatly increased. During the first twelve days of September there was an average daily death-rate from cholera of 24, but there has been a considerable decrease since the 13th of the month. Altogether, from September 1st to September 19th there were 357 deaths attributed to cholera within the walls of Paris. Adding this to the 342 deaths recorded during the previous five months, there was a total of 699 deaths within Paris. This figure, taken in conjunction with the 709 deaths in the suburbs, gives a grand total of 1,408, and is therefore considerably above the epidemic of 1884, which, as already stated, for Paris and the suburbs, did not quite reach the total of 1,000. These figures demonstrate only too painfully that I was justified when, in June and July, I insisted on the importance of the few cases that then occurred. I should also add that at the Nanterre prison and asylum there were 43 deaths, most of them occurring in the month of April. It is difficult to say whether these should be considered as suburban or Parisian cases; for, though the prison of Nanterre is in the suburbs, the patients, mostly vagabonds and beggars, sickened and died very shortly after their arrival from Paris. These 43 deaths increase the general total to 1,451 deaths."

This is given to show what a formidable local epidemic under the name of cholerine and attributed to the sewer pollution of the Seine drinking-water was occurring in France. We shall see hereafter what great interest attaches to this outbreak, from the fact that its origin has never been traced, that in so many cases no comma bacillus could be found, and that its fatality from the first, as well as all its symptoms, were those of genuine cholera.

Before cholera had extended beyond Russian territory there was the announcement of a serious outbreak of so-called cholerine at Havre, and not long after true cholera was recognized as existing there, having been brought, probably, from Paris.

Before any announced or recognized outbreak had occurred at Hamburg the French steamer St. Paul, from Havre, had arrived at Antwerp, and on the 16th of August "one of the crew was seized with violent cramps and conveyed to the Stayvenburg Hospital, where he died." August 17th there was also a suspicious case at Jumet, a mining town in Belgium of 24,000 inhabitants, in the person of Gohyssart, a workman who had just arrived from the suburbs of Paris. He died on Friday, August 19th. Nine similar cases followed soon after. The disease was called cholera nostras, which, as Surgeon-General Sir William Moore puts it, is generally an absurd name for what "would be unhesitatingly recorded as Asiatic cholera were it present at the time." It would, therefore, we think, be tenable to claim that Germany, and probably Hamburg, received first cases by way of the province of Galicia, in Austria-Hungary, from Russian immigrants, from the cholera outbreak in the suburbs of Paris, or from Havre.

There were slight outbreaks at Berlin and a few other points in Germany, in Belgium, in Holland, among emigrants coming to Great Britain.

The history of its transfer to the United States and of its progress here is given further on.

CHOLERA IN THE UNITED STATES, WITH SPECIAL REFERENCE TO NEW JERSEY.

The first appearance of cholera in North America was in the spring of 1832, in connection with the arrival of immigrants in Canada. On the 8th of June it appeared at Quebec, and in the same month at Montreal, New York City and Albany. Between June 13th and the end of the month there were about 20 cases in New York State, as it made its way along Lake Champlain toward Albany. New York City soon had a few cases. It was contended that cholera arrived in New York City in infected ships before it arrived in Canada, but that it was concealed by the Board of Health. Between the 1st of July and the 18th of August New York City had reported 5,337 cases, with 2,068 deaths. The city lost 3,513 in all. The population at that time was about 200,000.

Philadelphia (population about 150,000) had its first cases in July. From the 27th of July to August 18th it had 1,610 cases, with 615 deaths. There were a few cases in Boston and Baltimore in August.* Cholera entered twelve different States before December. Among the cities slightly affected were Detroit and New Orleans. The next year, 1833, it was severely epidemic in New Orleans. From thence it was carried northward to most of the large cities of the Mississippi valley. In New Orleans alone there were 6,000 deaths out of a population of 55,000.

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* See Lecture on Cholera, Dr. A. Clark; and Cholera: Its Nature, Prevention and Treatment, Dr. Henry Hartshorne, 1866.

As the disease prevailed both in New York and Philadelphia, it was natural that New Jersey should not escape. Of its extent in the middle and western portions of the State we have only fragmentary and traditional account. As no allusion is made to it in the Transactions of the State Medical Society, it is probable that only sporadic cases occurred in these parts of the State. As to the eastern and northern parts we are more fortunate in our record. The venerable Dr. S. H. Pennington, then a young physician practicing in Newark, gives, in a report to the State Society in the fall of that year, a most valuable outline as to it. (It is to be found in Transactions of the State Medical Society of New Jersey, 1766 to 1858, from "The cholera," page 302, to "circumspection," near top of page 306.) The same year Chief Justice Ewing died in Trenton from this disease. There were, no doubt, sporadic cases in other towns. We have knowledge of one death therefrom in Metuchen, Middlesex county, 1832.

In 1834 the cholera was again introduced by the way of the St. Lawrence into Upper Canada and the United States. Also, in 1835, from Cuba. In neither of these years did it become largely epidemic.

Cholera then disappeared from the United States until 1848. In that year, during its prevalence in Europe, two emigrant ships, a thousand miles apart on the ocean, had outbreaks of cholera. These both came from Havre, where no cases of cholera were known. One of these landed at New York and the other at New Orleans. New York was not affected by the infected ship, which arrived on the 1st of December, six days after the outbreak. She had lost seven passengers, and eleven were sent to the New York Quarantine Hospital. The other vessel reached New Orleans the 11th day of December, having lost several passengers. One cholera case was sent to the New Orleans Hospital. Two days after, the first case in that city was reported, being an immigrant from this ship. There was a rapid increase until the following June, when 2,500 deaths occurred. It is very doubtful whether North America was free from epidemic cholera until the end of 1854,* and some claim it was endemic in New Orleans until 1857.†

In 1849 it occurred, among other places, in New York, Philadelphia, Memphis, St. Louis, Chicago and Buffalo, in the spring of the year, and in Baltimore in July. There were 1,022 deaths in Philadelphia, the mortality in New York being about 450 per cent. greater.‡

In 1853, ships from infected ports arrived in New York, but the first appearance of cholera, following this, was in Chicago, among recently-arrived immigrants, in April, 1854. An infected ship also brought it to Quebec the 15th of June, 1854, and it spread through Canada and adjacent localities.

In 1854 the number of deaths from it in Philadelphia was not great. A remarkable outbreak took place that year in Columbia, Lancaster county, so serious that several Philadelphia physicians went to the relief of the overworked practitioners. Dr. Hartshorne speaks of it thus: "Visiting the town with other physicians of our city, during the epidemic, I learned that an exceeding drought had reduced the channel of the river to an unusually low ebb, and that, in its bed, a short space above the town, a number of carcasses of sheep and other animals, thrown from the railroad trains, &c., were putrefying rankly in the sun. A reservoir which supplied many of the people with drinking-water, was filled from the river not far from that spot, and the wind blew from it directly over the town. The first subsidence in the disease, we were afterward told, attended a decided change in the wind."

Pittsburgh was affected with a similar outbreak the same year, attributed to putrefying animal matter exposed to the sun.

In 1849, it will be remembered, that a local outbreak in the almshouse at Baltimore, was attributed to a large and foul cesspool, as it was confined to one-half of the building whose windows overlooked it. A similar case of localized outbreak occurred in 1866, in direct connection with the foul condition of the Lodi Poudrette Works, in Bergen county, where sixteen deaths occurred, and the place was at once vacated.

In the period from 1849 to 1854 there were outbreaks in New Jersey in each of the above-named years. We have no records of any in 1852 and 1853, although here and there a sporadic case may have occurred. In 1849 the writer was a student of medicine in Newark, and a few cases occurred in the street in which he boarded. Other cases were scattered through the city. There were many calls at offices of physicians for astringent and quieting medicines, and an increase of intestinal diseases in general, but there was not anything like panic as to cholera. We have a record of the outbreak, so far as it relates to the counties of Hudson and Passaic, by one of our ablest and most honored physicians, Dr. A. W. Rogers, of Paterson. (See New Jersey Medical Transactions of 1850, from page 504, "The first cases of cholera," to page 505, "approach to collapse.")

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* See American Supplement to Encyclopædia Britannica, article "Cholera," Dr. J. S. Billings.

† See New York Medical Record, September 24th, 1892.

‡ See Dr. Hartshorne, *cit.*

The report from Gloucester county for the same year, was by Dr. Joseph F. Garrison, a noted practitioner. (See page 514, "After the subsidence," to word "employed," top of page 515.)

In January, 1855, the Standing Committee for the year 1854 made its report. (See page 624, from "There was also noticed," to "thirty-seven deaths," page 627.)

Dr. Edward Vanderpoel, of New York City, who also saw much of cholera in 1832 and from 1849 to 1854, in a letter in the New York *Medical Record* of October 22d, 1892, gives the following account of an outbreak in Bergen county:

"In 1854 I was requested to go to English Neighborhood, now Fairview, six and a half miles from Hoboken, as an epidemic of cholera had broken out there from a load of decayed fish. All died, so that the doctor refused to go, saying it was of no use. The gentleman, Mr. Daniel Talcott, a committee of one from the Neighborhood, assured me of my pay by offering a blank check to fill at my own price, and a carriage to take me back and forth. I went; found some on the border of collapse. All recovered with the same treatment. I was paid by one family $150, and received a large, elegantly-embossed silver pitcher, engraved, as a token of successful treatment of cholera in English Neighborhood in 1854. Mr. Talcott is still living, doing business in this city as a real estate agent, having left the cotton trade, but still lives at English Neighborhood. He will give particulars of that fearful time that I am now unable to do.

"Respectfully,

"EDWARD VANDERPOEL, M.D.

"NEW YORK, September 30th, 1892."

As to the outbreak of cholera at English Neighborhood (Fairview), Bergen county, Mr. D. W. Talcott favors us with this note:

"NEW YORK, January 9th, 1893.

"*Ezra M. Hunt, M.D., Secretary:*

"DEAR SIR—The epidemic was confined to a radius of about one mile from the 'toll-gate,' which then stood in front of McDonald's grocery store, in about the center of the village. There was in all about fifteen deaths, and as the local doctor had confessed his inability to cope with the disease, the inhabitants were 'panic-stricken,' but the arrival of Dr. Vanderpoel, and the immediate success of his treatment, gradually allayed their fears. In fact, after his first visit, none of the cases resulted fatally, except only those who were then in a state of 'collapse,' and consequently past human skill. All new cases speedily succumbed to his treatment. The disease was said to have originated from a wagon-load of stale fish, but this is mere conjecture."

The next outbreak in the United States occurred in the city of New York, in May, 1866. Prior to this date, many vessels had arrived from European ports, and thirty such vessels had been detained during the latter part of 1865. It is usually considered that the cholera epidemic of 1866, in North America, was due to the steamship England, which left Liverpool for New York on the 28th of March, having 1,185 German and Irish immigrant passengers. One hundred and sixty cholera cases, with 46 deaths, occurred on this ship prior to the 9th of April, at which date she put into Halifax. On the 18th of April, 1866, the first vessel having cholera on board arrived at New York Quarantine, and from this point the disease gradually spread to Philadelphia, Cincinnati, St. Louis, &c. 'The mortality in Cincinnati was very large.

The report of the Sanitary Commission of New Jersey of that year says: "It visited Hudson City, Hoboken, Burlington and Camden, where it prevailed most severely, while several other places on lines of public travel numbered from one to fifteen cases. Over 200 cases were fatal. In nearly all cases it was directly traceable to some nestling-point in New York or Philadelphia; and in many instances the first case in a town would be in the person of a stranger or visitor recently arrived from one of these cities. The portability of the disease is fully established."

The report of the Standing Committee of the State Medical Society in May, 1867, for 1866, in its general summary, says that Asiatic cholera appeared in the counties of Hudson, Essex, Union, Burlington, Camden, Cumberland and Gloucester. In Hudson county Hudson City suffered severely, but in other parts there were but few deaths.

Dr. Culver says that in one wealthy family of very cleanly habits it resulted from the putrefying carcass of a horse a few rods to the windward of their residence. After it had been there a week a poor German was induced to remove and bury it, and he died of cholera the same night.

(See Transactions 1867, page 186, from "August 29th" to "the last season," page 190.)

A fuller and very interesting account of the cases in Camden in 1866, by Dr. J. R. Stevenson of Camden, is given in the same Transactions, and confirms the general relation to filth. Details are also given by Dr. William Elmer as to the fifteen cases and six deaths in Bridgeton.

Although there were cases in Philadelphia and a few others in this county, the origin of these cases was very obscure. The first one attacked was the child of a lumber merchant, and by some he was supposed to have contracted it elsewhere. Dr. Elmer presents no theory as to its origin. There were about 40 cases in the county, nearly half proving fatal. The first case in Newark occurred June 19th, and one other a few days after, while the next group of cases was not until August 18th. Cases occurred in various parts of the city, which could not be traced to this locality. In Burlington City seizure was short and rapid, there being 15 deaths out of 17 cases in a period of about three weeks. The origin of the cases is not known.

It is impossible to state with accuracy the proportion of deaths to cases, but as a rule an epidemic of cholera is regarded as very fatal if more than two-fifths die. The recent epidemic at Hamburg (1892) was classed as very severe. In the period of its greatest virulence from the beginning, August 23d, the official record for eight weeks was 17,962 cases and 7,598 deaths. The population of the city is about 600,000.

In 1866 there were 900 deaths from cholera in Philadelphia, nearly all in the northeastern section of the city, where was the inlet of the water-supply near a filthy shore.

Armstrong gives as follows the deaths in New York City in four epidemics, namely, 1832, 3,512; 1849, 5,071; 1854, 2,509; 1866, 1,210. (See *Review of Reviews*, October, 1892.)

The next outbreak began in New Orleans in February, 1873, but there is no satisfactory evidence as to the mode of its commencement or the manner of its introduction. From New Orleans the disease spread to the Mississippi valley, appearing in Mississippi, Arkansas and Tennessee in April; in Illinois, Kentucky, Ohio and Indiana in

May; in Alabama and West Virginia in June; in Georgia and Minnesota in July; in Pennsylvania, Texas, Utah and Dakota in August, and in New York in September. An elaborate account of this outbreak was published by Congress under the title of "The Cholera Epidemic of 1873 in the United States,"* by Surgeon Ely McClellan, U.S.A.

The epidemic was almost confined to the Southern and Western States, Louisiana and Kentucky suffering with great severity. There were four cases and four deaths in Pittsburgh in one locality, which were promptly dealt with, and no extension occurred.

Our next epidemic dates from August, 1892. The first infected ship that came to the port of New York was the Moravia, from Hamburg. She left there August 18th, the day that cholera was announced in that city, and arrived here August 31st. She had 358 steerage and no cabin passengers. Twenty-two passengers of the steerage had died during the voyage. All but two were children. The few that were sick were transferred to Swinburne Island and the vessel and passengers held in quarantine. Other vessels infected with cholera arrived in September, as follows: September 3d, the steamer Rugia, of the Hamburg-American line, with 476 immigrants and 98 cabin passengers. She reported four deaths from cholera during the voyage, and there were ten cases on her arrival. The Stubbenhuk and Normannia, from Hamburg, arrived the same day, reporting cases. The latter reported five cases among its steerage passengers. The Heligoland, an oil vessel, reported two cases among its crew. September 5th there were three deaths from cholera at New York Quarantine, and September 6th, eleven. September 8th there were four more deaths and two new cases at Quarantine. September 16th the steamer Bohemia arrived from Hamburg with a report of 52 cases of cholera on the voyage.

The first case on land in the United States occurred in New York City on September 6th, but the announcement was delayed until Wednesday, September 14th, when five deaths in all were reported. The delay was said to have been in order to make biological diagnosis, the presence of the comma spirillum being made the diagnostic test in all cases. There was no definite knowledge of the way the disease had entered the city. The last case of cholera in New York City was September 29th. Ten cases in all were identified. We give these because of strange diversity as to locality, date, &c.:

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* For this volume see library of the State Board of Health.

Number.	Date of Reports.	Name.	Age.	Sex.	Color.	Civil Condition.	Nativity.	Time in U. S.	Occupation.	Residence.	Result.	Date of Discharge.
1	Sept. 6..	Chas. McAvoy..........	32	M.	W.	S.	Ireland....	8½ years	Laborer...........	879 10th Ave...	Died at residence..........	Sept. 6, 9:30 P. M.
2	" 10..	Peter Callahan.........	30	"	"	"	" ...	4 mos.....	Stableman	318 E. 47th St.	" "	" 10, 10 A. M.
3	" 11..	Wm. Wiegman	52	"	"	M.	Germany	30 years...	Butcher	768 11th Ave...	" "	" 10, 5 A. M.
4	" 11..	Sophia Wiegman......	68	F.	"	"	"	32 " ...	Housewife........	" " ...	" "	" 11, 4 P. M
5	" 12..	Minnie Levinger......	20 mos.	"	"	S.	U. S........	Life.........	Minor............	411 E. 46th St.	" "	" 11, 4 A. M.
6	" 13..	Chas. Beck..............	35	M.	"	M.	Germany	32 years...	Butcher...........	1764 2d Ave......	Recovered......................	" 11, ——
7	" 13..	Charlotte Beck.........	31	F.	"	"	"	30 " ...	Housewife..	" "	Died at residence..........	" 13, 4 P. M.
8	" 13..	John Knox...............	41	M.	"	"	Ireland. ..	3 days....	Sailor	S. S. Nevada.....	" on steamer............	" 13, 7:30 P. M.
9	" 19..	Lewis Wienhagen.....	56	"	"	"	Germany	7 years...	Coachman.......	14 1st St.........	" at Reception Hosp..	" 28, 6 A. M.
10	" 29..	Joseph Miller...........	45	"	"	"	"	10 " ...	Potato dealer...	255 W. 29th St.	" " residence...........	" 29, 7:30 A. M.

All of which is respectfully submitted,

(Signed) CHAS. F. ROBERTS, M.D.,
Chief Inspector.

A few fresh cases occurred at Quarantine up to October 5th, when the Port Physician reported no cases of cholera and two convalescents.

The only case of death in New Jersey was that which took place at New Brunswick and is thus described by Dr. H. R. Baldwin:

Dr. E. M. Hunt, Secretary, &c.:

DEAR DOCTOR—In reply to yours of the 4th inst.: James Carr was taken with cholera on the 17th of September, about 11 o'clock in the evening. Vomiting, purging and cramps marked the attack. When seen a few minutes after 9 on the 18th he was in collapse. Death ensued about 6:30 P. M. Carr came from New York on Friday, the 16th, and was apparently well during Saturday, the 17th, until night. His boat was at the foot of Thirtieth street, North river. In my judgment, the infection may have been received from floating debris. Upon recognition of the disease, solutions of the bichloride of mercury, 1 to 500, were poured over the soiled bedding, and carbolic acid solution equal to 5 per cent. used also on floor and bedding. The whole premises and surrounding blocks were disinfected by a strong solution of bromine. The family were moved from the basement to the upper part of the house, having first changed their garments as far as possible. The basement of the house was then fumigated by burning sulphur for twenty-four hours after patient died. The bedding and all infected articles, lounge and carpets, were destroyed by fire. The body was wrapped in a blanket saturated with a solution of the bichloride mercury, 1 to 250, and buried soon after midnight. In the meantime a rigid quarantine had been enforced, none except the physicians, undertaker and disinfector being allowed to enter the dwelling, and none of the inmates being allowed to come outside the yard. The privy was treated with a solution of bichloride and solution of bromine. The hands of those liable to infection were washed in a bichloride solution, as well as carbolic acid solution. The specimens of dejecta were taken to New York to the Health Department, and were said to contain the comma bacillus. No other report has been received from that source The quarantine was maintained until September 23d.

Very truly yours,

HENRY R. BALDWIN,
President Board of Health.

The third and fourth cases which occurred in New York City have also an interesting relation to New Jersey.

The facts are thus stated by the New York physician in attendance:

"William W., tripe-butcher, aged 52 years, was first taken ill on Friday, September 2d. On the following day W., accompanied by his wife, went out of the city to pay a visit to relatives living at a little place called Athenia, near Paterson, N. J. At this time, Mr. W. was suffering from a mild diarrhœa. While there he at first improved. But overindulgence in unripe fruit, with copious draughts of very cold well-water, caused a re-appearance of his diarrhœa. Therefore, on Tuesday, September 6th, the couple returned to their home in New York City. Early in the afternoon, Mr. W. applied

> at a drug store in his neighborhood for an ordinary diarrhœa remedy, which was given him. This he immediately vomited. He had not vomited before this. At 8 o'clock in the evening I was summoned, which was the first time that the patient was seen by a physician, although the symptoms had first appeared on the preceding Friday. The symptoms which the patient presented were similar to those which we find in aggravated cases of cholera morbus. As already intimated, no history of known exposure to the infection of Asiatic cholera could be discovered, and although the symptoms were violent they were not more so than I have frequently seen in cases of cholera morbus in years past. Furthermore, though the case was viewed with suspicion, the symptoms were not violent enough, nor was the appearance of the patient such as to suggest the existence of Asiatic cholera."

He died September 10th. On the same day his wife was taken sick having had a couple of large, watery stools, but she had not vomited or complained of pain. She died the evening of the next day. Biological examination revealed the spirillum of cholera. No such examination had been made of the discharges of her husband. The physician, without investigation, presents the following vagrant hypothesis of the origin of the disease:

> "In reviewing the husband's case, I think that we may safely consider his earliest symptoms as due to an ordinary diarrhœal attack, and that the symptoms, caused by the Asiatic cholera first appeared on September 9th, seven days after his visit to New Jersey. In the case of his wife, the first symptoms occurred on September 10th, eight days after the visit to New Jersey. The incubation period is, I believe, from five to ten days. Both patients were in all probability exposed simultaneously to the source of infection, therefore. Near the little place in New Jersey which the W.'s visited, is situated Dundee, a town of many factories. This place receives its quota from every emigrant ship which arrives at these shores. Is it not possible that before the disease was detected, or even officially declared as existing, at Hamburg, and before quarantine was enforced in our harbor against arrivals from that port, the germs entered our gates and found their way to Dundee? And does it not in consequence seem very plausible that the W.'s, in some unaccountable manner, received the infection into their system in their trip to Athenia, for the time which had elapsed between their visit to that place and the appearance of their choleraic symptoms just about equaled the time embraced in the period of incubation?"

On seeing this, I at once wrote to Dr. J. A. Leal, the Health Officer at Paterson, who, at our request by telegraph, had before aided the Local Board of Health in disinfecting the premises at Athenia, and who had fully investigated the case. His reply is as follows: "The man who afterwards died with cholera came to Athenia because he was ill. His illness consisted of diarrhœa and vomiting. Not improving he returned to New York in a little less than two days and died with cholera as reported. While in Athenia he was in contact with no one outside of the immediate family he was visiting. Said family received no visitors during the time he was there, and he himself did not leave the premises except in coming and going. His course to and from the depot was direct, and no stops were made. No immigrants and no others except neighbors had been at house where he was visiting for at least six months previous. The Dundee Mills are at least three miles from said house. Lastly, there had been and was afterwards no suspicious sickness in Athenia or Passaic, in which Dundee Mills are located, or in the neighborhood. The theory that the disease could have been contracted during his visit here is utterly ridiculous."

We have great reason for gratitude that, with the threatenings abroad and with the arrival of so many cholera-stricken vessels at the New York Quarantine, the disease did not extend, and that its entrance into New York City did not result in any foothold of the disease. To what this may have been owing there is some room for difference of opinion. In any case it is a good time for us to note certain facts as to cholera, to comment on the methods used for its prevention and to inquire what is desirable in preparation for its possible or probable advent during the present year. We ask and seek to answer a few leading questions:

I. How does cholera occur, especially in the United States?

The best-sustained view is that it is an Asiatic disease, and has never occurred in this country except as derived from a previous case through persons or things from abroad. This is taken to mean that either an individual, or material emanating from him at the time of his sickness, contains the *contagium*.

II. How is it communicable?

There is great variety of opinion as to how it is communicable. A few claim that it is not so at all; many more that it is feebly so. Most believe that it is chiefly or entirely conveyed by routes of travel, and by persons and things in process of transportation. Many view cargoes, baggage (fomites) and the locality of the sick as far more likely to convey the disease than the individual. Some believe in its aërial conveyance, and quote such cases as that of the emigrant ships New York and Swanton (1848), which left an uninfected port about the same time and had outbreaks at sea, one of them sixteen days and the other twenty-seven days out from Havre; that of Marseilles, in 1884, when Dr. Brouardel and others failed to trace any origin, and that of Paris, in 1892, and many others that have eluded search.

All such inquiries are important, for they go far toward deciding as to quarantine systems, land cordons, &c., as to which not only authorities but nations still differ.

We cannot but regard the advance of the present epidemic from India through Persia and Russia and Europe to this country as furnishing new evidence that at present the disease only occurs in Europe and America by transportation.

Of the many who believe in a contagium as contained only in the flux from the intestines and the vomitings from the stomach, not a few believe it not to be operative at first, but to require a little time for fermentive and other changes. This was the most prevalent view until of late. (See Pettenkoffer, Ilisch, Macnamara, Elisha Harris, McClellan, Loomis, Flint, &c.)

Those who accept in full the microphytic or microbic theory seem compelled for consistency to regard it as a poison from the first, but from what we know of ptomaines and of the chemical character of changes wrought by microbes, the view of those who believe in vicious changes after voidance cannot be entirely thrust aside.

III. The most accepted view now is that the contagium resides in a particular one of the many microphytes found in the discharges, viz., in that known as the comma bacillus of Koch. In our own country solely on it, were based systems of germicidal disinfection and the diagnosis of the disease. The many opposing views of high authorities dwindled into insignificance if not into contempt before the "taking it for granted," which was especially characteristic of Health Boards and their biological advisors in this country.

Yet it is to be kept in mind that this view is not acceded to by many excellent English and French authorities. There is difference of opinion as to the form of the bacillus now regarded as a spirillum, as to the relation thereto of other changing forms found in the intestine, as to the identity of the Indian and Egyptian bacillus and as to whether it has spores. We are to regard ourselves as having in hand a probable working hypothesis, but need to be careful to recognize that various points are not indisputably settled.

IV. Whatever be the question as to its contagium there has undoubtedly been great misconception as to its communicability. At times, and in repeated instances, so great is its explosive violence, that we naturally measure its possibilities by these most malignant results. Yet Surgeon-General Murrey tells us that in four epidemics in India, 1877, 1878, 1879, 1880, there were 154,986 villages attacked. In 58,972 of these there was only one death, and in 20,596 only two deaths. The fact that in these years the total mortality was 1,380,226 shows how fearfully destructive it is when it finds all the requisite conditions and is not guarded by efficient sanitary police. This of itself shows that some other facts than its accidental arrival determine its virulency. These facts are generally local filth, personal filth, overcrowding and the absence of an efficient sanitary administration ready to act forthwith—which means knowing beforehand what to do, and having been provided with means to do it. While certain climatic conditions may still frustrate our efforts in part, yet our only safety is in thus using the means which all are now agreed greatly tend to prevent epidemics or to restrict their extent and virulence.

That the same is at present the case has been more lately confirmed by Surgeon-General Moore, Surgeon-General Cornish, Sir Joseph Frayer and others familiar with cholera in India, and has been repeatedly illustrated by European and American experiences. Sometimes we are able to account for its explosive violence by special filth, by pollution of potable water or by some remarkable atmospheric conditions and development of stench. But yet it must be confessed that there are many cases of mildness and others of intense virulence that defy all plausible and probable explanations.

At Marseilles, in 1884, the water-supply was fairly good, and its severity was attributed to the pollution of the river by most fœtid sewer deposits. Its severity at Hamburg in 1892, in comparison with its comparative mildness at Antwerp, has generally been attributed to the foul water-supply of the Elbe, although the comma bacillus was not found in it. The escape of Great Britain with but twenty-three cases, and not one of these from extension of cases, is attributed to its excellent sanitary system and efficiency in dealing with first cases by isolation and disinfection.

Sometimes flight has limited it. Thus out of the 80,000 inhabitants of Toulon in 1884 it is reckoned that all but 25,000 left the city, many going to Marseilles and intensifying the outbreak there. It is said that over 100,000 fled from Marseilles, and yet in that year only 1,784 deaths were reported there.

Conditions of weather have seemed to have a great influence as to rapid increase of cases. Such was the case at Toulon and Marseilles, and at the outbreak at Niagara Falls, 1854, besides many other cases. Indeed, so frequent is this as to establish undoubted relations between its virulence and climatological conditions.

The influence of fear and panic is noticeable as with yellow fever.

In all these, and many other respects, the facts as to it are not different here from those as to its occurrence in Asia.

Surgeon-General Moore says that "There is an unknown atmospheric condition, occurring more frequently in easterly than in westerly countries, which, meeting with certain but unknown conditions of matter, present most usually in unsanitary localities, generates an invisible, impalpable, chemically and microscopically, unrecognizable germ or poison, which may be conveyed in all directions, by human beings, by cholera excreta, by clothing, by some varieties of merchandise, by water, by food, by insects, especially flies, or through the atmosphere to an undiscovered extent, in a more certain manner, in a more virulent form and to a greater distance, if favorable atmospheric influences exist." Surgeon Moore, while recognizing the communicability of the disease, insists that in India it sometimes arises *de novo* and would do so elsewhere if the same atmospheric and telluric conditions existed. Other India practitioners support this view.

Dr. Abbott, of Massachusetts, well says that its so serious and habitual occurrence in India arises "in the fact that the climatic and meteorological conditions of that country offer the favorable conditions for its continuous preservation or growth outside the human body."

In fact, it is not in these respects different from several other diseases, such as yellow fever, influenza, diphtheria, &c., which show relation to climate and weather, as well as to soil, as to filth and as to personal cleanliness and personal surroundings.

It has most of its laws in common with those of other epidemics, having, as these have, some explosions of excessive violence and other milder outbreaks.

The main question before us in its practical bearing is, What are we to do in order to prevent first cases of cholera, or in case of their occurrence to prevent other cases arising from the first?

So long as the disease is not in the country we accept, as our first method, that of rigid quarantine. As any access from abroad to this State is only gained through efficient quarantines of adjacent States already in operation, we have no need to discuss this matter here. Our only duty in this regard is to see to it when passengers, or cargo, or baggage are released from quarantine, that we be aware of their destination in this State, and in this as in other diseases exercise more or less degree of watchfulness over such immigrants arriving in our cities and country districts. This was being done before the advent of the cholera. Local Boards will continue to be notified, so far as it seems practicable. Some of the Western Boards, notably that of Michigan, have urged that this should extend not only to passengers from ships on which contagious disease has occurred, but, in so serious a disease as cholera, to all ships and passengers from countries in which the disease prevails. This, it seems to us, can only be necessary when there is more evidence of danger from such sources.

Our next important service is in the securement of absolute and enforced cleanliness in every locality supervised by Local Boards, and especially those localities to which strangers or those who are sick are likely to come.

There is no disease that seems so selective as cholera. Even more than typhus fever it is a filth-bred disease. When actually present its spread, as between filth and cleanliness, is as much governed by surroundings as is the extension of a flame of fire by the question whether it lights amid shavings or on hard wood. Not only are general foul conditions bad, but there are so many cases where severity of outburst has been associated with a dead carcass, with accumulations of offal, or with stench factories, that the coincidence could not be accidental.

The one work for Health Boards this spring is thorough house-to-house inspection, and cleansing of ground, houses and persons so far as possible. Nothing can take its place. Inspection is good, but execution is better. The nuisance must not only be *observed, but abated.*

Special attention needs to be given to places where people congregate. For this reason assembly-rooms, railroad stations, court-houses and jails, and especially all outbuildings connected with them and so used in common, should be *put* and *kept* in thorough order.

When a case actually occurs the first great point is *isolation.* How this is most fully accomplished depends somewhat on circumstances, but still more on the fact that there is a local officer ready to act and knowing what to do.

New York City plans, which have been approved by Dr. Stephen Smith, Dr. E. G. Janeway, Dr. A. Jacoby and Dr. R. H. Derby, as a committee of the New York Academy of Medicine, are thus outlined:

These consist of—

I. Organization of a corps of medical inspectors for the immediate care of each case of cholera, and of the well persons who may be exposed to the disease.

II. Ambulance service for the immediate removal of the sick to the hospital.

III. Disinfecting corps to clean the room and disinfect clothing.

In practice, on information being given of the location of a case of cholera, a detail of physicians at once visits the house and takes charge of the premises. If the sick person must be removed, they attend to his being placed in the ambulance, and one accompanies him to the hospital. Others attend to the isolation of the family in the room, and of the families in the house, and maintain a strict watch over all persons who may have come within the limits of infection during the period of possible liability to the disease. The disinfecting corps burns all soiled and useless clothing, and disinfects by boiling water all articles to be preserved which can be thus treated. The floors and furniture, and all closets and exposed areas or passageways, are washed with sublimate solution. During the possible period for the incubation of the disease the premises are rigorously quarantined, and constant medical inspection of all exposed families is made to discover any cases of diarrhœa. If the immediate family of the sick person is destitute, it is removed to the hospital, and the members are regarded as "suspects," who require constant watch and care. For hospital purposes the Board has secured and fitted up the floating hospital of the St. John's Guild, which lies at the foot of Sixteenth street and East River. The Disinfecting Department is under the direction of Dr. Biggs, and when some improvements are completed it will answer every purpose required.

Next to general cleanliness is attention to water-supplies.

The one thing that seems emphasized by every recurring epidemic is that drinking-water is the great conveyancer of the disease and that it has no nestling-place, no virulence, no extension so great as when able to find a polluted water-supply and make it the medium of communication.

The multiplied experiences of former epidemics have been emphasized by the condition of the Seine of Paris and of the Elbe at Hamburg.

Even when the source of water-supply is good the sharpest attention must be given to the condition of the intake, the pipes, the reservoirs and stand-pipes, the faucets and house distribution in general. Every Local Board having within its jurisdiction a public water-supply should, during the winter and spring, have careful and expert examination made of the structural arrangements, of methods of filtering and of all particulars relating to local storage and distribution. Where errors are found Boards should be emphatic in their condemnation and summary in their correction. It will not do in such matters to be pushed aside by corporate powers, interests or influence. There never was a time in this State when, for this and various other reasons, such exact attention should be given to public water-supplies. The same attention must be given to each city well and, indeed, to any wells or springs from which drinking-water is taken. Cholera and other intestinal diseases often owe their severity to impure water. Until remedy can be had the water should be boiled, and it should be available in cities at public places, but this temporary resort cannot excuse the neglect of more radical measures.

As the disease is not, as a rule, conveyed by air, isolation relates mostly to the patient and his room.

Outbuildings or other spots to which he has been should be disinfected, but it is the room itself and everything in it that must be protected from soiling, or any soiling that occurs must not be transferred from the room without thorough cleansing and disinfection. What this means has already been made clear in treating of details of cleanliness in previous circulars, and now also in an article on disinfectants and deodorants in this report. It might be added that the physician himself needs special precaution as to putting down of the hat or other garments in the room, as to the use of the colored corrosive sublimate mixture which he can easily carry with him for the cleansing of hands, &c., and as to a cleansed condition of mouth, so that he may not in any wise be a carrier of particles, or be himself unduly exposed.

If the sole source of contagion is contact with the secretions, protection of self and surroundings is much easier than from most communicable diseases.

The prompt care of discharges, the disinfecting, washing or boiling of garments without removal and the thorough cleansing of the room when the patient is removed include details which have been fully set forth and are well understood by those who have the energy and faithfulness to execute them.

Our own choice of disinfectants is fresh chloride of lime (six ounces to a gallon of water) or fresh-slaked lime (one quart to four quarts of water) for the discharges, and the corrosive sublimate mixture for most other uses.

We here repeat the corrosive sublimate formula: Dissolve half an ounce of corrosive sublimate and five grains of commercial aniline blue in three gallons of water and add thereto one fluid ounce of hydrochloric acid. Preserve in earthenware jars or wooden tubs. This is approved by Thorne Thorne, M.D., Chief Medical Officer of the Local Government Board of England, and by Dr. Parsons and Dr. Notter, also excellent authorities. This addition prevents the precipitation of the sublimate or salts of mercury which might take place in the case of albuminous fluids. If aniline blue is not at hand permanganate of potash or common bluing may be used in its stead.

One dram of corrosive sublimate to a gallon of water represents about a strength of 1 part to 1,000, and two drams to a gallon, 1 in 500. We mention these as common proportions.

The great caution needed as to all disinfection of rooms, furniture, clothing and surroundings is that it be not allowed to take the place of that washing, scrubbing, wiping, house-cleaning, airing and general cleansing which have no substitute. All disinfection is merely preliminary work, yet too often the Health Inspector reports upon it as if the use of this or that chemical was not the beginning but the end for securing thorough cleanliness and safety.

It is in our province only to add a few words as to treatment. This depends largely upon the particular stage and condition. Most of the former modes of treatment have still some advocates, such as the castor oil or early cathartic treatment, the tannic or other astringent treatment, the saline treatment by injections of hot salt water or by hypodermic injections, and of course methods of transfusion with sterilized blood serum come in for their share of advocacy.

For preliminary stages we have already, in Circular 45, suggested a good prescription. Professor Horner of Philadelphia gave, with apparently excellent success, a few drops of equal parts of chloroform, oil of camphor and laudanum every five minutes in sweetened ice-water. Dr. Nelson, in the Montreal epidemic, relied much on freshly-powdered opium in one-grain doses, when vomiting occurred, to be repeated if rejected; the object in all these cases being chiefly to allay stomach irritation. The giving of a dose of castor oil in the early stages probably does good by protecting the intestinal surfaces and allaying the irritation of the poison. There is a sense in which, in all cholera, we are not treating a disease, but dealing with a case of poisoning.

The sulphuric acid treatment seems to have been emphasized by the acceptance of the comma bacillus or spirillum as a cause. The fact that the normal, acid juices of the stomach are capable of destroying the comma bacillus is stated. The danger of taking water when the secretion is neutral is pointed out, and it is therefore recommended by Dr. Shakespeare that during cholera epidemics the drinking of water between meals should be avoided. We have before this advocated the use of aromatic sulphuric acid, lemonade, &c. (See Circular 45.)

The Royal College of Physicians (England) has, in response to the request of the Local Government Board, given the following directions as to preparation and dealing with early symptoms:

ROYAL COLLEGE OF PHYSICIANS, September 3d, 1892.

SIR—In complying with the request of the Local Government Board to furnish it with instructions for the management of health in view of the prevalence of diarrhœa and of cholera, the Royal College of Physicians desires to say that the instructions herewith submitted are not intended either to occupy the general ground of prevention so ably and admirably covered by the medical advisers of the Board, or to supersede the necessity of immediately summoning medical assistance to those stricken with disease. They are meant to be followed only when the assistance of a doctor cannot be procured and when diarrhœa has not developed into cholera The College proposes no instructions for the treatment of cholera. Every case of this disease requires separate consideration and management; no stereotyped plan of treatment would prove to be either wise or safe; and usually before the choleraic nature of an attack could be established medical assistance would have been procured.

The chief instructions to be followed for the prevention of diarrhœa and of cholera are herewith appended:

1. As cholera is not, in the ordinary sense of the term, contagious, as it is rarely, if ever, communicated, like small-pox or scarlet fever, directly from person to person; as it is probable that those engaged in attendance upon patients suffering from this malady are not more liable than others to become attacked with it; and as it is certain that physical and moral depression favor the reception and development of the disease, apprehensions should be allayed, confidence encouraged, and that manner of living pursued which experience has proved to be conducive to the highest health.

2. The house should be clean, light, thoroughly dry and well ventilated. Air-shafts, traps and drains should be in perfect working order. Dustbins should be frequently emptied, and no decaying matters of any kind should be permitted to remain in or near the house. Cisterns, reservoirs, casks, jars and pipes used in the preserving, carrying or transmitting of water should be frequently inspected and carefully cleansed. All connections of waste-pipes with drains should be severed.

3. As water is one of the chief agents by which choleraic infection is conveyed, all water employed for personal and domestic use in the household should be scrupulously protected from contaminations of every kind; and if any doubts of its purity arise, the water should be boiled, filtered and consumed within twenty-four hours. Boiled and filtered rain-water is probably the best of all waters for use at this time.

4. The dietary should consist daily of three or four simple but nourishing and ample meals, taken at regularly recurring times. The meals may consist of any sort of animal food, fresh and thoroughly cooked, of bread, potatoes, well-boiled green vegetables, if they agree, and of plain farinaceous puddings, or of simply cooked, wholesome fruit.

Milk should be boiled before use.

Alcoholic beverages should be taken in great moderation, and only at the greater meals, such as at dinner and supper.

It is desirable to avoid soups, tinned or otherwise preserved provisions, raw or stale vegetables, unripe, over-ripe or decaying fruits, pastry, cheese, nuts, hard or indigestible things of every kind, malt liquors turning "hard," ginger beer, strongly ascescent sparkling wines, coarse oatmeal gruel, messes between meals, and either long fasts or too frequent feeding.

5. All provisions should be procured fresh, but when some storage is unavoidable the most scrupulous care should be taken to protect them from contamination by impure air or water.

Cooking utensils should be scalded after use and kept carefully clean.

6. Avoid the use of strong aperients, and especially of strong saline aperients. If there is obstinate constipation, take at bedtime either a teaspoonful of Gregory's powder or one or two teaspoonfuls of castor oil.

7. Avoid excess and irregularities of every kind, over-fatigue, prolonged watchings, emotional excitements, undue mental strain, and all such things as irritate and exhaust the nervous system.

Especially avoid the frequent use of alcoholic or of any stimulants to cover recurring sensations of sinking, malaise, or depression.

8. Take moderate exercise twice daily, follow early hours, and aim at leading a regular, an occupied, and a tranquil life.

CONCERNING THE MANAGEMENT OF LOOSENESS OF THE BOWELS.

9. If, notwithstanding this careful regulation of the manner of living, looseness of the bowels should set in, send immediately for medical assistance, since without personal examination and direction no case of this kind, arising in such circumstances, can be satisfactorily or even safely managed. But if medical assistance is not immediately available, follow the subjoined instructions until the doctor arrives.

10. Choose, if practicable, a bright, airy room, go at once to bed, keep quite warm, and if troubled with cramps or pains apply hot applications to the entire stomach.

11. Take freshly-prepared fluid or semi-fluid food in quantities of a large cupful at a time regularly every three hours. Such food may consist of boiled milk thickened with rice flour, baked flour, or biscuit powder; of tea made with boiling milk infused about five minutes, and having toast, biscuits or rusks soaked in it; of farinaceous puddings of the nursery sort; of any kind of gruel, except that made with coarse oatmeal; of meat jelly, of beef tea, or of mutton, chicken, or veal broth.

If pain persists, with depression or faintness, take a tablespoonful of brandy or of whisky in a small claret glassful of hot water after meals, twice, thrice, or four times in the course of the twenty-four hours, but not oftener than is absolutely required for relief.

12. If thirst becomes excessive, sip from time to time small quantities of iced water just sensibly acidulated with fresh juice of lemons or with aromatic sulphuric acid.

13. As soon as possible after looseness of the bowels has begun, take in capsules or in hot milk, or in any other manner preferred, two teaspoonfuls of castor oil. If when the action of the oil may be fairly supposed to have ceased the looseness increases to a watery diarrhœa, let the hips be well raised and carefully inject into the bowels a quart or more of hot water containing two drachms of benzoate of soda or thirty grains of tannin. Furthermore, if there be much pain in the bowels, fifteen to thirty drops of laudanum may be added to the injection. The injection should be retained as long as it is comfortable to the patient, and it may be repeated once or twice daily during the continuance of the diarrhœa and until medical assistance has been procured.

[We omit prescriptions.]

16. From the first appearance of looseness of the bowels the body should be washed with warm water night and morning and quickly dried. Soiled bed or other clothing should be immediately disinfected and destroyed.

A cheap and efficient disinfecting fluid is recommended by Dr. Thorne Thorne, and is thus prepared: Dissolve half an ounce of corrosive sublimate and five grains of commercial aniline blue in three gallons of water and add thereto one fluid ounce of hydrochloric acid. Preserve in earthenware jars or wooden tubs.

17. All further general precautions necessary to be taken at this time are admirably set forth in the memorandum issued on August 26th by the medical officer of the Local Government Board.

I have, &c.,

ANDREW CLARK, M.D.,
President of the Royal College of Physicians.

The following is the substance of the precautions against the infection of cholera, as advised by the Local Government Board of England, so far as they would apply here:

Former experience of cholera in England justifies a belief that the presence of imported cases of the disease at various spots in the country will not be capable of causing much injury to the population, if the places receiving the infection have had the advantage of proper sanitary administration; and, in order that all local populations may make their self-defense as effective as they can, it will be well for them to have regard to the present state of knowledge concerning the mode in which epidemics of cholera (at least in this country) are produced.

Cholera in England shows itself so little contagious, in the sense in which small-pox and scarlatina are commonly called contagious, that, if reasonable care be taken where it is present, there is almost no risk that the disease will spread to persons who nurse and otherwise closely attend upon the sick. But cholera has a certain peculiar infectiveness of its own, which, *where local conditions assist*, can operate with terrible force, and at considerable distances from the sick. It is characteristic of cholera (and as much so of the slight cases where diarrhœa is the only symptom as of the disease in its more developed and alarming forms) that *the matters which the patient discharges from his stomach and bowels are infective.* Probably, under ordinary circumstances, the patient has no power of infecting other persons except by means of these discharges; nor any power of infecting even by them, except in so far as these matters are enabled to taint the food, water or air which people consume. Thus, when a case of cholera is imported into any place, the disease is not likely to spread, unless in proportion as it finds, locally open to it, certain facilities for spreading by *indirect infection.*

In order rightly to appreciate what these facilities must be, the following considerations have to be borne in mind: First, that any choleraic discharge, cast without previous thorough disinfection into any cesspool or drain, or other depository or conduit of filth, is able to infect the excremental matters with which it there mingles, and probably, more or less, the effluvia which those matters evolve; secondly, that the infective power of choleraic discharges attaches to whatever bedding, clothing, towels and like things have been imbued with them, and renders these things, if not thoroughly disinfected, capable of spreading the disease in places to which they are sent for washing or other purposes; thirdly, that if, by leakage or soakage from cesspools or drains, or through reckless casting out of slops and waste-water, any taint (however small) of the infective material gets access to wells or other sources of drinking-water, it can impart to enormous volumes of water the power of propagating the disease. When due regard is had to these possibilities of indirect infection, there will be no difficulty in understanding that even a single case of cholera, perhaps of the slightest degree, and perhaps quite unsuspected in its neighborhood, may, *if local circumstances co-operate*, exert a terribly infective power on considerable masses of population.

The dangers which have to be guarded against as favoring the spread of cholera infection are particularly two. First, and above all, there is the danger of water-supplies which are in any (even the slightest) degree tainted by house refuse or other like kind of filth; as where there is outflow, leakage or filtration, from sewers, house-drains, privies, cesspools, foul ditches or the like, into springs, streams, wells or reservoirs, from which the supply of water is drawn, or into the soil in which the wells are situate; a danger which may exist on a small scale (but perhaps often repeated in the same district) at the pump or dip-well of a private house, or, on a large or even vast scale, in the case of public water-works. And secondly, there is the danger of breathing air which is foul with effluvia from the same sorts of impurity.

Information as to the high degree in which those two dangers affect the public health in ordinary times, and as to the special inportance which attaches to them at times when any diarrhœal infection is likely to be introduced, has now for so many years been before the public, that the improved systems of refuse-removal and water-supply by which those dangers are permanently obviated for large populations, and also the minor structural improvements by which separate households are secured against them, ought long ago to have come into universal use.

So far, however, as this wiser course has not been adopted in any sanitary district, security must, as far as practicable, be sought in measures of a temporary and palliative kind.

(*a*) Immediate and searching examination of sources and conduits of water-supply should be made in all cases where drinking-water is in any degree open to the suspicion of impurity; and the water both from private and public sources should be examined. Where pollution is discovered, everything practicable should be done to prevent the pollution from continuing, or, if this object cannot be obtained, to prevent the water from being drunk. Cisterns should be cleaned, and any connections of waste-pipes with drains should be severed.

(*b*) Simultaneously, there should be immediate thorough removal of every sort of house-refuse and other filth which has accumulated in neglected places; future accumulations of the same sort should be prevented; attention should be given to all defects of house-drains and sinks through which offensive smells can reach houses; thorough washing and lime-washing of uncleanly premises, especially of such as are densely occupied, should be practiced again and again.

It is certain that in many places such conditions are present as would, if cholera were introduced, assist in the spread of that disease. It is to be hoped that in all these cases, the local sanitary authorities will at once do everything that can be done to put their districts into a wholesome state. Measures of cleanliness, taken beforehand, are of far more importance for the protection of a district against cholera than removal or disinfection of filth after the disease has actually made its appearance.

It is important for the public very distinctly to remember that pains taken and costs incurred for the purposes to which this memorandum refers cannot in any event be regarded as wasted The local conditions which would enable cholera, if imported, to spread its infection in this country, are conditions which day by day, in the absence of cholera, foster and spread other diseases—diseases which are never absent from the country, and are in the long run far more destructive than cholera. Hence the sanitary improvements which would justify a sense of security against any apprehended importation of cholera would, to their extent, though cholera should never re-appear, give amply remunerative results in the prevention of those other diseases.

R. THORNE THORNE,
Medical Officer of the Board.

Local Government Board, August 26th, 1892.

We also print herewith the excellent circular of the German Government, which, in its chief features, is equally applicable here:

BERLIN, July 28th, 1892.

INSTRUCTIONS WITH REGARD TO THE NATURE OF CHOLERA, AND CONDUCT TO BE OBSERVED DURING ITS PREVALENCE.

1. The infectious element of cholera is found in the discharges of the sick, and by means of these discharges may be transferred to other persons and to objects of the most varied description, thus diffusing the infection. Some of these objects are articles of clothing, especially underclothing of every description, cloths, articles of food and drink, &c.; by all of these the disease may be conveyed from the sick to the well, even when traces of the discharges are present in quantity too small to be perceived by any of the unaided senses.

2. The spread of cholera from one locality to another may therefore easily take place, when a person actually diseased or recovering from the disease, or a person who has been in contact with the sick, leaves his habitual residence and seeks another presumably safer. The objections to such change of residence are, that the person may have been already infected; and, if not, that he will probably fare better under his customary surroundings, pursuing a well-regulated habit of life with appropriate precautionary measures, than he would in a strange place or upon a journey.

3. To avoid the danger of introducing the disease into their homes, people should not receive those coming from infected districts. Upon the appearance of cholera in a place, all persons therein are to be regarded as possible carriers of disease.

4. In a cholera epidemic all persons should live a carefully-regulated life. Experience teaches that disturbances of digestion favor an attack of cholera; therefore, excesses in eating or drinking, and the use of substances difficult of digestion, should be strictly avoided. Especially are those substances to be discarded which produce diarrhœa or disturb the stomach. Should diarrhœa appear, a physician should be at once consulted.

5. No food should be eaten which comes from a house wherein a person is sick with cholera. Such articles of food or drink, by means of which the disease can be easily transmitted, are to be avoided; as fruit, vegetables, milk, butter, fresh cheese; or, if taken, should be first cooked. Milk appears to be especially dangerous in its uncooked state.

6. All water that can by any possibility have become polluted by excrement, urine, kitchen-waste or other foul material, should be carefully avoided. Water from an inhabited water-shed is suspicious, as is also water from swamps, ponds and streams or rivers, because these are likely to receive drainage from impure sources; especially dangerous is a water which can have received the discharges of the sick, no matter how remotely. In this connection, especial care must be taken that water in which the garments of the sick or their cooking utensils or table-service have been washed, shall not obtain entrance to a water-supply directly or indirectly, by being poured upon the surface of the soil in vicinity of the water. The best water is furnished by deeply-driven pipe-wells.

7. If it is not possible to get a water above suspicion, the water should always be boiled, and only boiled water should be drank.

8. The observations above made in respect to drinking-water, apply also to all water used for domestic purposes, because infectious matters, existing in waters used

for washing dishes and household utensils, for washing and cooking food, for washing and bathing the body, may thus be brought into the human system. In general, a warning should be given that drinking-water is not the only carrier of the disease, and that full protection is not secured even when a pure drinking-water, or one that has been boiled, is used.

9. Every patient with this disease may become the starting-point of an extensive epidemic, and it is therefore advisable not to retain the sick person in a dwelling-house, but to remove him to a proper hospital whenever possible. If such removal is not practicable, prevent, as far as may be, all visiting of the sick.

10. No one, unless he be called by duty, should visit a house where cholera exists. Also in time of epidemic people ought to avoid crowds, such as fairs, public markets, theaters and the like.

11. Food or drink should not be taken in rooms where the sick are, also for personal reasons no smoking.

12. As the discharges are especially dangerous, clothing of all kinds that may be polluted thereby, should be at once burned or disinfected, as hereafter directed.

13. Especial care should be taken that the discharges do not come near wells or streams used for water-supply.

14. Everything that comes in contact with the sick, and which cannot be destroyed or disinfected, should be removed to a specially-arranged disinfection station, to be there made harmless by means of steam, or should be disused for at least six days and set away in a dry, sunny, well-aired place.

15 All persons coming in contact with the patient, his bed or his clothing, should immediately disinfect their hands, especially when they become soiled by the discharges. Emphatic warning is to be given not to touch food with infected hands, or to place anything in the mouth which may have become infected in the sick-room; *e g.* glasses, dishes, spoons, forks, cigars, &c.

16. When a death occurs, the corpse should be removed as soon as may be from the dwelling-house to a mortuary. If the corpse cannot be washed in the mortuary, omit the washing. The funeral should be as simple as possible, moreover, should not enter the house, and there should be nothing in the nature of a wake.

17. Clothing or other articles belonging to the sick or the diseased, must not be used or given away until they have been disinfected; especially must not be sent in their infected condition to other places. Whoever receives such articles from places where cholera exists, is earnestly advised to have them properly treated at a public disinfecting station, or to cause them to be disinfected under their own direction. Body-clothing, sheets, &c., of cholera patients, should not be washed until disinfected.

18. No other means of protection against cholera than those above given are known, and the public are warned against the use of the regularly-vaunted proprietary medicines which are supposed to prevent cholera.

SUGGESTIONS FOR THE MANAGEMENT OF DISINFECTION IN CHOLERA.

A. The Means to be Employed.

1. Milk of lime. To prepare this, take one liter (about a quart) of pure, broken quicklime, add to three-fourths of a liter (about three-fourths of a quart) of water in appropriate vessel; when the lime has taken up the water and become reduced to a powder, add three and one-fourth liters (about three and one-half quarts) more of water and stir the mixture well; keep in a well-closed vessel and shake before using.

2. Chloride of lime. This is a satisfactory disinfectant only when freshly prepared and kept in well-closed vessels. A good preparation can be recognized by the well-known odor of chlorinated lime. It may either be used in form of powder or in solution; the latter to be made by mixing two parts of chlorinated lime with one hundred parts of cold water; after the undissolved portions have settled the clear fluid should be poured off.

*3. Solution of potash soap. (So named green, black, soft soap.) Three parts of soap to be dissolved in one hundred parts of hot water, *e. g.* one-half a kilogram (about one-half a pound) soap in seventeen liters (about four and one-half gallons) of water.

*4. Solution of carbolic acid. Crude carbolic acid dissolves imperfectly, therefore is not suitable for use. The so-named 100 per cent. carbolic acid of commerce dissolves in the soap solution, and is a convenient form of the acid for use. Take the solution of soap described in Section 3; to twenty parts of this warm solution add one part of this carbolic acid and stir in. This preparation keeps well and is a better disinfectant than the plain solution of soap. If the distilled qualities of carbolic acid are used, which, though much dearer, are no better as disinfectants than the above-named 100 per cent. carbolic acid, the soap solution is not necessary; simple water suffices as a solvent.

5. Steam apparatus. Apparatus arranged for direct application of steam at 100° C., or that arranged for superheated steam, may be employed.

Boiling the articles to be disinfected half an hour at least. Boiling to be constant and articles to be well covered by the water.

B. Manner of Use.

1. The fluid discharges, vomit or excrement to be mixed in vessels with equal quantities of milk of lime (A1). Mixture to stand at least one hour before it is put to one side as innocuous. Chloride of lime may also be used, two heaping table-spoonfuls in powder form to be added to each half liter (pint) of discharges, and to be well mixed. Disinfection will be accomplished in fifteen minutes.

Whenever the hands or other parts of the body come in contact with infected objects, discharges of the sick, soiled clothing, &c., they must be at once disinfected by thorough washing with the chloride of lime solution or with the carbolic acid solution.

3. Bed and body linen, as well as other clothing of washable sort, are to be placed in receptacles filled with a disinfecting fluid as soon as infected. The solution for this purpose should be either the soap preparation or the carbolic acid mixture. In the first-named these articles should remain twenty-four hours, in the last twelve hours, before final washing. These articles can also be disinfected in steam apparatus and by boiling with water; but even in this treatment the objects must first be well moistened with one of the above-described disinfecting fluids, and inclosed in well-secured receptacles or in bags, or wrapped up in cloths also wet with disinfecting fluid, in order that employes who have the handling of these objects before the disinfecting process is completed, may not be unnecessarily exposed. In every case all who touch such articles should at once disinfect their hands, as above directed.

4. Garments not washable are to be disinfected in steam apparatus. Leather articles to be rubbed with carbolic acid solution or chloride of lime solution.

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*3 and 4 are not so available with us.

5. Wooden and metallic surfaces of furniture, &c., and other similar objects to be rubbed repeatedly with rags moistened in carbolic acid solution or soft soap solution. Floors of sick-room to be treated in the same way. The rags after use to be burned. The floor can also be treated with milk of lime, which should remain in contact with it at least two hours, and may then be wiped off.

6. The walls of the room and such woodwork as will not be injured by the treatment can be whitewashed. After disinfection of a room has been accomplished it should be left vacant for at least twenty-four hours, and well aired.

7. Soil, pavement or gutters fouled by cholera discharges may be disinfected by copious flooding with milk of lime.

8. In privies a liter of milk of lime should be poured daily down each opening. Any receptacles used in the privy-vault to receive excrement should, after emptying the same, be well covered with milk of lime, inside and outside. Wooden seats in privies should be washed with the soft soap solution.

9. In case a sufficient disinfection, as above directed, cannot be obtained, *e. g.* in the case of stuffed furniture, feather-beds, &c., and a steam disinfection apparatus is not accessible, or if disinfecting solutions are not at hand, then the articles needing disinfection are to be put out of use for at least six days, in a place protected from rain, but as much as possible exposed to sun and air, where there can be no access to them.

10. Objects of little value should be destroyed by burning.

ADVICE TO PHYSICIANS AS TO CO-OPERATION IN SANITARY MEASURES TO BE CARRIED OUT IN TIME OF PREVALENCE OF CHOLERA.

The success of any measures inaugurated by public sanitary authority depends in no small degree upon the assistance given by physicians in their execution. Their special knowledge enables them to appreciate the significance of measures recommended, and their relations to the public give them abundant opportunity to exert their great influence in the interest of the public weal. The members of this profession have so often and in so high a degree, in like circumstances, shown their devotion to the public good that it is not permitted to doubt that here also in the struggle with cholera, both in general and in each individual case, their willing co-operation will be given.

The points at which this activity can be most usefully shown are stated in the following sections:

1. Every suspicious case to be immediately announced to the district medical officer and to the local police authority (by telegraph, if possible; expense to be repaid by officer).

2. Until a definite diagnosis can be made, all precautions as to isolation and disinfection must be observed in the same manner as though the case was undoubtedly cholera.

3. All discharges to be disinfected as above directed; also all infected objects—clothes, linen, furniture, floors, &c.

4. Patient to be as thoroughly isolated as possible, with special nurse. If this cannot be done in a private house, then admission should be sought to a hospital or other building prepared for treatment of such cases, and provided with sufficient means of disinfection.

5. Full instructions to be given to nurses as to care and disinfection of their own clothing, hands, eating in same room with the sick, &c.

6. Strict attention must be given that infective material is not placed near wells, either by throwing these discharges not properly disinfected, or by washing in their vicinity soiled clothing, dishes, &c. This precaution applies to all sources of domestic water-supply. If there is suspicion that such water-supply is already polluted, then the local sanitary authority is to be notified, and measures are to be taken that such suspicious water-supplies shall be abandoned and the public warned against their use.

7. If the sick person dies before arrival of physician, the corpse and all personal articles are to be kept under supervision and apart until the arrival of the medical officer, or until action is taken by the local police authority.

8. Investigations should be made for the purpose of ascertaing how the infection has taken place in each case, and whether any opportunity has been given for the spread of the disease (by infected articles, &c.); also whether there have been any other suspicious occurrences on the spot.

9. With the occurrence of the first cases in any place, and when the certainty of diagnosis is of the highest importance, a quantity of the discharges (not too small) should be placed in a clean jar or bottle for purposes of bacteriological examination. In case of necessity a few drops might answer the purpose, or some of the soiled clothing can be used.

10. Physicians skilled in bacteriological examinations can help materially in hastening a decision, if they will at once proceed with this examination, both by microscopical aid and by plate cultures; and if the case is found to be cholera, they can at once inform the medical authority of the fact, and, if possible, send him a specimen of the slides or plates made.

CLIMATIC FEATURES OF THE HIGHLANDS IN THEIR RELATION TO HEALTH.

BY J. C. SMOCK, PH.D., STATE GEOLOGIST.

The term Highlands in its broader signification is made to include the Kittatinny valley, the Kittatinny mountains, and valley of the upper Delaware river, as well as some of the hill country in the northeastern and north-central parts of the State. It is here restricted to the mountain ranges which are bounded on the northwest by the Kittatinny valley and on the southeast by the lower, red-sandstone plain. It is nearly coincident with the limits of the district occupied by the archæan or crystalline-rock formations. A natural division of the State would make the following climatic provinces in the northern part of the State, viz.:

1. The Delaware river valley west of the Kittatinny mountain.
2. The Kittatinny mountain (or Blue mountain).
3. The Kittatinny valley.
4. The Highlands.
5. The red-sandstone plain.

This division is based upon the larger geological and topographic features, and the meteorological records appear to correspond somewhat broadly to these divisions.

The Highlands constitute a table-land, which on the southeast side rises 500 to 600 feet above the plain country on that side, and 900 to 1,200 feet above the ocean, and on its northwest border is 600 to 1,000 feet above the Kittatinny valley and 1,000 to 1,400 feet above sea-level. Within this area there are several well-known valleys. The Ringwood, Rockaway-Longwood, Succasunna plains, German, Musconetcong, Pohatcong and Pequest are the large depressions which trend northeast and southwest. There are many minor depressions of surface which are locally important, but are, in fact, slight topographic features. The ranges of mountains bear names of more or less local extent, of which the Ramapo, Schooley's, Hamburg-Wawayanda, Jenny Jump and Pochuck are well known.

The surface formations of the Highlands present somewhat of diversity and the measure of the effect upon climates of localities is unknown, although recognized as a factor. The southwestern part is generally well drained and there is an absence of swampy surface, excepting in some of the valleys. The granitic and other crystalline rocks of the hills and mountain ranges are much disintegrated and the residual surface-earth and soils are rather coarse-granular and sufficiently open to allow of good drainage. The flora gives proof of this character, and the notable chestnut timber on some of the ridges is indicative of dryness. The indirect effect of a surface of this kind upon the climate is great, and particularly in its relation to health. Well-drained soils are not limited in this part of the State to the Highlands, but they form so large a part of the surface, at the south and southwest, in Morris, Hunterdon and Warren counties, as to merit consideration in a study of the climate of the Highlands.

In the country further north and to the northeast, in Sussex, Passaic, the northern part of Morris and the northeastern part of Warren counties, the presence of glacial drift modifies the surface. The terminal moraine is the boundary line of these divisions. There is more of the bare rock and little or no disintegrated *rock-gravel* surface, as well as more swamp and many lakes and ponds in the northern part of the Highlands. In fact, there is more diversity in the nature of the surface. The presence of larger lakes, as Greenwood, Hopatcong, Budd's, Green and Splitrock, exercises a slight effect, although perhaps, not capable of proof by meteorological observations. It might be termed a lake-country in contrast with the southwestern Highlands. The derangement of the older drainage system of the preceding geological ages by the ice-sheet has resulted in a comparatively ill-drained surface and has given origin to many wet meadows and swampy tracts, as well as lake basins, all of which have their effect upon the humidity of the lower air strata and upon the temperature and, possibly, upon the amount of snow and rain. The larger forested area tends to check the circulation of the air and reduce the force of the wind. The more coniferous forest growth also exercises an appreciable effect in certain localities, but of the subtle influence of conifers upon the health of the inhabitants there is no accurate data, and the proportion of conifers to deciduous trees in the Highlands is probably too small to be taken into account in a discussion of the healthfulness of the region.

The dominant topographic feature of the Highlands is the northeast-southwest direction of its mountains and its valleys, and that in line with the prevalent summer wind-direction and crosswise or against the cold northwest, and the southeast winds laden with sea moisture. The crests of the mountains are more exposed, and therefore colder in windy weather, whereas the valleys are more sheltered and generally warmer. Of the effect of mountains as barriers to air-currents, except in some notable localities and districts, little is accurately known. Their relation to health has perhaps been studied most in Switzerland and in the Mediterranean Riviera. Some of the health resorts of these European districts are justly famous as winter resorts because of the shelter afforded by high mountains. That the hills of the New Jersey Highlands are equally effective cannot be asserted, but it is probable that these ranges do exert a measurable effect and afford some shelter in certain localities, softening slightly the rigor of winter's cold. Full meteorological statistics are wanted to indicate the degree of this amelioration and the general influence upon climate and health of the marked topography of the Highlands.

Another important climatic feature based upon the surface configuration is the height above sea-level and also above the general level of the adjacent lowlands and valleys. The decrease in temperature and in absolute moisture corresponding to elevation is a measurable element, and from height alone the mean temperature ranges from two to five degrees less than it would be at sea-level. The difference appears in the lower daily minimal temperatures and the less intense heat of summer, or the heat is less oppressive with less moisture and more air circulation on the mountains than in the valleys. Although in general this district is cooler, there is some variation due to situation, and some of the smaller and narrow valleys are perceptibly colder in still weather than the hill-tops. They become reservoirs, down into which the cold air flows and settles. The effect of altitude is to make the winter colder and the summer cooler over the Highlands generally. That these features affect health and are seen in mortality tables needs no argument.

The less moisture in the air at higher altitudes is so closely related to temperature in its influence upon the human system that it is difficult to dissociate them. A mean height of 1,000 feet above the ocean has an average diminishing effect which is determinable by computation. The relative humidity does not, however, vary in the same ratio for increase of height. Viewed *en masse* the Highlands make a colder, dryer air, with less rainfall, although the number of days with some rain or snow and the relative humidity may be greater than in the lowlands and valleys on its sides. A variation in the rainfall in the more local storms of the warm months of the year, due to the situation as affected by topography, must exist and be a measurable quantity. The position of hills, the direction of slopes, and the forest-covering or its absence, combine to modify the amount of precipitation in the storms of less extent. The winter storms are of wider sweep and are not much modified by the comparatively little mountains of the Highlands. Perhaps the most notable climatic feature is the greater snowfall and less rain in the winter than on the adjacent lowlands. The connection is close between the elements of moisture and rainfall and healthfulness, but not comparatively demonstrable in this case.

The situation of the Highlands and the relation to the red sandstone plain and to the ocean deserve attention. The former lying on the south and southwest, affords a clear and dry passage for the hot summer winds. And they are to some extent made dryer by it and also heated, and the effect is in general to produce warmth and dryness, especially in the autumn and late summer. The Kittatinny valley, a deforested belt, has a somewhat similar effect on the west side, but much less, as it is so much narrower than the red sandstone plain. The distance from the ocean, from thirty-one to sixty miles, tends to reduce the amount of moisture in the sea-winds, and robs them of their excessively chilling property, so noticeable in the seaside localities at certain seasons. For some affections, this distance from the ocean makes the Highlands a better climatic province than that of our coastal plain.

These general statements of the climate of the Highlands, as modified by altitude, situation, topography, surface formation, forests and soil, afford a clue to its characteristics, and give means for judgment as to its relation to health. This relation has been referred to in these generalizations on the climatic features. The dryness of the surface, the large part cleared and in farms, the absence of swamps and of bodies of stagnant water or of sluggish streams, the height above the sea-level, the dry, red-sandstone plain and the distance from the ocean, are the important characteristics of the southern part of the Highlands, which conduce to healthfulness. The more swampy and less well-drained tracts in the northern part of the district, may make an exception in the case of some forms of disease. There is apparently an entire absence of malarial disorders on the hills and mountains at the southwest and south of the terminal moraine. In the more wet country to the north they are prevalent in some localities. The many instances of longevity in some of these hill towns, appear to be evidence of healthfulness, and the absence of epidemics generally confirm this opinion. This upland country may be said to be as healthy as any part of the State, and the cause is largely in its favorable climatic features. The extremes of temperature are less than they are in New England or in New York State, and the winter is notably milder than in those States. There is less of acute lung disease and less consumption. To refer to one place: Schooley's mountain has been famous as a health resort for nearly a century, though not overrun by a tide of health-seekers or invalids. It may be considered as a representative locality of many in the Highlands.

The following table of the deaths in a thousand, in a period of fourteen years, for typical townships and groups of townships in the several natural divisions of the State, is here given in illustration of the general healthfulness of the Highlands. There are twenty of these groups. The statistics are from the mortality tables of the Bureau of Vital Statistics for the years 1878–1892. The total deaths for the three classes of diseases—consumption, acute lung diseases and diarrhœal diseases—are compared severally with the mean population for the period. For this comparison the statistics of population which are here employed are the United States census returns for 1880 and 1890:*

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* These statistics were compiled in the office of the State Board of Health of New Jersey by David S. South.

GROUPS.	TOWNSHIPS.	Population (mean), 1880-1890.	Consumption—Number of deaths out of 1,000.	Acute lung diseases—Number of deaths out of 1,000.	Diarrhœal diseases—Number of deaths out of 1,000.
I.	Chester, Mendham, Morris county	3,377	33	29	13
II.	Bethlehem, Lebanon, Hunterdon county	5,087	26	22	16
III.	Pompton, Passaic county; Randolph, Rockaway, Morris county	16,737	21	31	21
IV.	Byram, Sussex county; Jefferson, Morris county; West Milford, Passaic county	5,633	23	26	16
V.	Sandyston, Walpack, Sussex county	1,645	19	24	12
VI.	Hardwick, Warren county; Stillwater, Sussex county	1,942	24	23	6
VII.	Frankford, Wantage, Sussex county	4,957	30	30	12
VIII.	Newton, Hampton, Lafayette, Sussex county	4,400	27	20	12
IX.	Kingwood, Delaware, Hunterdon county	4,623	22	16	9
X.	Franklin, Montgomery, Somerset county	5,577	26	28	19
XI.	Union, Union county; Saddle River, Bergen county	4,408	17	22	15
XII.	Holmdel, Marlboro, Monmouth county	3,580	27	20	20
XIII.	Springfield, Mansfield, Burlington county	3,462	18	22	14
XIV.	Mannington, Pilesgrove, Salem county	6,036	39	26	25
XV.	Woodland, Shamong, Burlington county	1,353	19	26	18
XVI.	Monroe, Winslow, Camden county; Franklin, Gloucester county	6,435	34	23	30
XVII.	Hammonton, Atlantic county; Landis, Cumberland county	9,645	36	21	17
XVIII.	Brick, Dover, Ocean county	6,187	36	20	16
XIX.	Little Egg Harbor, Bass River, Burlington county	2,755	26	21	23
XX.	Cape May county	10,516	23	18	20

The groups are representative as follows: Nos. 1, 2, 3 and 4, the Highlands; No. 5, the Delaware river valley; Nos. 6, 7 and 8, the Kittatinny valley; Nos. 9, 10 and 11, the red sandstone plain; Nos. 12, 13 and 14, the greensand marl belt; Nos. 15, 16 and 17, the southern interior; Nos. 18, 19 and 20, the coastal plain.

These figures show that the death-rate for the Highlands from consumption is lower than in the southern part of the State, whereas that for the acute lung diseases is higher. The diarrhœal diseases do not show any marked differences in the deaths for the several groups of townships or districts. The second group is perhaps the best representative Highlands territory and especially of the southwestern part. The third and fourth represent the more northern and the partly drift-covered portion of the Highlands. It may be noted that the Kittatinny valley, shown in Nos. 6, 7 and 8, has a larger death-rate for both consumption and acute lung diseases, but less for diarrhœal diseases. Additional statistics of age, as well as longer periods, are, however, needed to make the comparison more valuable.

COMMENTS ON SELECTED DISEASES.

BY EZRA M. HUNT, M.D., MED. SUPT., S. V. S.

DIPHTHERIA.

In our last report we gave full consideration to diphtheria, and in a special circular gave a summary of advanced views in regard to it. It still has its obscurities as to origin and its embarrassments as to treatment, although we regard the recognition of its primary, local manifestation in the throat and fauces as guiding to some important methods in the early treatment of cases.

The work of R. Thorne Thorne, now Chief Medical Officer to Her Majesty's Local Government Board, on "Diphtheria, Its Natural History and Prevention," is a most valuable discussion of the whole subject. It recognizes the increase of the disease in cities and the influence of soil, season, age, &c. While recognizing the relation of simple sore throat to diphtheria, he is "inclined to attach increasing importance to the view that much of the prevailing diphtheria is due to the circumstance that there exists a number of non-specific conditions of the fauces—inflammations and otherwise—which constitute a favorable soil for the reception and growth of a wandering diphtheria contagion." While the non-identity of scarlet fever and diphtheria is asserted, the susceptibility of scarlatinal sore throat to diphtheria contagion is recognized. The absorbent and culture qualities of milk need to be guarded against. Recent evidence seems to throw much doubt upon the identity of so-called diphtheria as found in the lower animals, although the relation still needs much study. The precise relations of diphtheria and croup we still have to consider as undetermined. Such inspections as that of Mr. Spear, Local Government Board, show that we still have practically to classify them as one. Such a case as that of diphtheria or croup in Central Africa (*Lancet*, September 19th, 1891), seems to favor the occasional *de novo* origin of the disease.

There seems to be so much question as to the origin of diphtheria and so many possibilities of its relation to local influences that Sir George Buchanan, Chief Medical Officer of Her Majesty's Local Government Board, in a brief review in the report, 1890-91, speaks of it as "a disease which we have learned by experience to regard as among the least 'specific' of the infections met with in human communities."

Our chief and valuable resources consist in the early diagnosis and local as well as general treatment of cases, in exact care of the sputum, in accurate isolation, and in such thorough room-cleansing and general cleanliness as tend to limit disease or destroy its exciting causes.

Professor Löffler, in a recent German journal, writes as follows as to it:

"He commences by asserting that the bacilli first described by him are the cause of the disease. To destroy the poisonous action of these germs two things are necessary: first, to guard against the inroad of the bacilli into the healthy mucous membrane; secondly, to destroy the bacilli if they have already attacked the superficial layers of the mucous membrane of the larynx and parts generally invaded, to prevent an extension of the process to unaffected parts, and to destroy the infective material before it affects healthy individuals. Professor Löffler has made most exhaustive researches as regards the effects on the bacilli of various drugs. These are too numerous to enumerate here, although the results of the action of these agents are given in detail in his paper. During an epidemic of diphtheria, or at any time when healthy persons are necessarily brought into contact with patients suffering from the disease, he recommends that as a prophylactic measure a gargle should be used of a solution of corrosive sublimate of the strength of 1 in 10,000 or 1 in 15,000. This should be employed for five or ten seconds every three or four hours. This gargle, however, has a disagreeable metallic taste, and a solution of cyanide of mercury of a strength of from 1 in 8,000 to 1 in 10,000 is equally effective, and less nauseous. Other solutions which he recommends are 1 part of chlorine in 1,100 parts of water, to which a little chloroform may be added, and a solution of thymol, 1 part being dissolved in 500 parts of 20 per cent. alcohol. As preventive measures also such remedies as oil of eucalyptus, oil of citron, oil of lavender, benzol, and toluol, given in the form of vapor, are successful. Passing to the active treatment of the disease, he recommends that the patient should gargle every hour or two with one of the weak solutions already mentioned, and he should, in addition, use gargles containing drugs which have been shown to destroy artificial cultures of the baccilli. Of all the numerous agents which he has tried, Professor Löffler recommends the following as being the most efficacious: Corrosive sublimate 1 in 1,000, 3 per cent. of carbolic acid dissolved in 30 per cent. of alcohol and also alcohol and oil of turpentine, to each of which is added 2 per cent. carbolic acid. After a short time the throat may be painted every three or four hours with 5 per cent. carbolic acid, 2 per cent. bromine solution, or 1 per cent. chlorine-water. Concentrated watery solutions of creosote may be employed. Professor Löffler concludes by expressing the opinion that if his suggestions are fully carried out the mortality in diphtheria will be greatly diminished, for the bacilli only develop locally, and are not carried by the blood to other parts of the body; consequently, if they are destroyed at an early stage in the disease, only a small amount of poison will have entered the body, and this it may reasonably be hoped the organism will succeed in throwing off. The important researches made in this direction by Behring and Kitasato may help to throw light on the difficult question whether the human body is capable of destroying poisons formed in the circulation by the development of bacteria."

PHTHISIS PULMONALIS—TUBERCULOSIS.

During the present generation of physicians there is perhaps no disease as to which there have been more phases of medical belief. The accepted doctrine had been that it is a *constitutional and very often a hereditary disease*. There were differences of view as to whether certain forms of pulmonary lesion were one and the same disease, and as to whether certain other diseases of glands, joints, skin, &c., were of the same nature, and variance of view as to histology, &c., but in general the descriptions of Watson, Wood, Flint and various other authorities were closely allied.

From such teachings we came to consider (1840) that of which Niemeyer presented the fullest outline. He contended that phthisis generally had its start in a croupous pneumonia, passing on to caseation. It is now denied that this ever takes place except in the presence of tubercle. There have also been numerous discussions, some of which are still undecided, as to whether the various forms of neoplasms, or degraded deposits known as tubercle, and occurring in diseases quite dissimilar, could all be placed under the one heading, tuberculosis, including the whole range from scrofula to lupus.

We have now reached the period when the advanced views in medicine and surgery reject all former views, discarding heredity as formerly taught, minimizing the influence of the individual as to temperament, condition or general environment, and substituting therefor in its entirety the doctrine of a specific micro-organism and of contagiousness. Here, for instance, are common definitions: "Tubercular infection in the tissues of the body means tubercle bacilli—their presence and products. The all-important source of germ-supply is the dried pulverized sputum of phthisical patients. The bacillus gains entrance to the body by (1) aspiration, through the respiratory tract; (2) ingestion, through the intestinal tract; (3) accidental inoculation, through abraded surfaces; (4) the placental circulation, congenital. These are here mentioned in the order of their importance and frequency." (W. P. Northrup, M.D., Pathologist of the New York Foundling Hospital. Paper read before the New York Academy of Medicine, January 20th, 1891.)

A similar definition, as a specimen, is that taken from a memorial by the Medico-Chirurgical Society of Glasgow, December, 1891, and signed by Profs. Joseph Coates, M.D., William T. Gairdener, M.D., Hugh Thomson, M.D., &c. "Tuberculosis is an infectious disease in the sense that in all cases of this disease the one constant and necessary element in the causation is a microbe. This microbe grows and multiplies in the bodies of certain animals and of man when introduced from without, and in so doing it produces an intensely active poison, which is the more direct agent in bringing about the morbid changes in the living structures. There are doubtless other elements in the causation, such as inherited and acquired susceptibility, but the microbe is the only essential and constant one, and there is evidence to show that, without any special susceptibility, it may produce the disease if introduced in sufficient quantity." The same memorial says: "It is believed that tuberculosis is fairly to be compared, as regards its infectious quality, if not with typhus and small-pox, at least with typhoid or enteric fever, although the mode and channel of the infection may be so different as to make it much less obviously dangerous to live in the same house or room with a case of consumption than it would be in the case of one of the well-known contagious fevers."

The recent "Treatise on the Diseases of the Lung and Pleura," by the late Wilson Fox, M. D., F.R S., edited by Sidney Coupland, M. D., F.R.C.P., London, J. & A. Churchill, 1892, has over 400 pages devoted to tuberculosis of the lungs, and is one of the most complete expositions on phthisis that can be referred to. He declares his firm belief in the unity of the disease, and says: "The point on which I would insist is that, whether it be regarded as infectious or constitutional, the different appearances of tubercle cannot be classified separately, according to arbitrary histological definitions; it must, I believe, be regarded as a *disease*, and for this disease a distinctive name is desirable." This author further says: "It may now be very generally accepted that tubercle can be reproduced by inoculation with tubercle, but with tubercle alone." Again he recognizes a second etiological factor: "As a hypothetical question it may be held that, even if tuberculosis depends exclusively on the effect of bacilli introduced into the body, these may owe their power of germination in certain tissues to the weakening of the latter by disease or other causes."

While then we have very important shades of opinion, reaching from that of Dr. Koch, who regards the bacillus tuberculosis as the only etiological factor and speaks of tuberculosis as a highly-infectious malady, to those who look upon it as in practice not so easily communicable and as dependent on conditions of the individual, we nevertheless recognize the belief in its dependence upon this bacillus and in its contagiousness as the most accepted doctrine of the profession.

But inasmuch as these views are so frequently and forcibly presented, and as there is a very respectable minority who modify these statements, or who do not accept them, it may be well to note what these shades of difference are. The truth never suffers by viewing the many sides of a question.

The first great difficulty which arises is as to what disposition to make of the doctrine of heredity as related to the doctrine of sole bacillary origin. George Cornet, of Berlin, early faced the question by saying that the doctrine of heredity was fatal to the latter. This seems to be the necessary, logical statement; but, if so, to most minds it involves great difficulty. In a case like that given by Jacobi, where, to use his language, in an autopsy made on the body of a fœtus, he found "the viscera simply packed with tubercle," or in a similar case recently reported from Paris, or a case given by Dr. Northrup, of New York City, in which a child, whose mother died a few weeks after giving it birth, on autopsy showed "the most extensive and apparently the oldest tubercular process located about the porta of the liver," we almost seem to have evidence of direct heredity. Yet here in the last instance, it is added, "the case suggests the possibility that the child may have received its bacilli through the fœtal circulation from its tubercular mother. * * * Congenital tuberculosis is very rare, and tubercular lesion of the placenta is probably the source of infection; the bacilli may enter the blood stream from the placenta as from a lung lesion."

Baumgarten, an eminent authority and familiar with bacteriological investigations, in an article in the *Deut. Med. Wochenschrift*, October 13th, 1891, claims that heredity is perhaps a more important factor than inhalation of bacteria. (See *N. Y. Medical Record*, August 22d, 1891.)

He has reported a case of infection of the ovum by tubercular semen, but although he is good authority, some question has been raised as to this. Baumgarten, Kindfleish and others claim and give some proof that the bacillus tuberculosis could be inherited and remain latent many years. (See *N. Y. Medical Record*, February 20th, 1892, pages 219 and 220.)

It is thus that a hypothesis is started to account for congenital cases, which are rare, as well as cases in young infant life. This, however, will not reach the multitude of observations and the experiences of thousands of practitioners who believe in heredity. This belief is founded not only in the analogies that come from inherited features, from inherited insanity, inherited cancer, inherited growths of various kinds, and other distinct inheritances, both of natural form and variation from structure and acquired diseases. It more directly comes from instances in which the disease has occurred in families where no association can account therefor and where long years of interval have interposed between cases. In fact this law of heredity is to many minds as positive in its demonstrations as any of the experimental tests of the laboratory. Hence the more general tendency shown has been to give it partial credence by talking of predispositions, of a general adynamic condition of non-resistance and to adjust old views so as still to hold to the new belief. We have been much interested in the reading of paper after paper on this subject by various authors, advocates of a single bacillary origin, to note with what skill and almost self-deception they attenuate the doctrine of a heredity of it, which amounts to no heredity at all, into a plausible kind of explanation.

Unless it is accepted that the bacillus tuberculosis is actually transmitted from mother to child, which is not yet claimed, except by a very few, there is a conflict between heredity and the sole bacillary origin of the disease on which we yet need light. According to Koch, a micro-organism must comply with the following requisitions before its pathogenic character is determined. The so-called "Koch's laws," or "rules," are: 1. It must be proved to be present in all cases of the disease in question. 2. It must further be present in this disease, and in no other, since otherwise it could not produce a special definite action. 3. A specific micro-organism must occur in such quantities, and so distributed within the tissues, that all the symptoms of the disease may be clearly attributable to it. 4. After removal from the body of an affected animal, and its growth in pure culture, the inoculation of the latter into susceptible animals must produce the disease in question.

The view that all forms of phthisis pulmonalis must have a bacillary origin, is not quite so clear and decided as some would seem determined to have us believe. In addition to the individual doubt or reserve, of a few eminent practitioners, we have quite recently two lectures on cases of fibroid phthisis, by Sir Andrew Clark, of London, President of the Royal College of Physicians, which are well worthy of careful reading, because he so fully combines a knowledge of biology, with thorough clinical and diagnostic ability. We only quote a few suggestive lines. While he is willing to make a distinction between "tubercular" and "fibroid," he insists that there is real phthisis without the presence of bacilli at any time in the history of the patient. After defining phthisis as "that assemblage and progression of symptoms due to the ulcerative or suppurative destruction of more or less circumscribed non-malignant deposits in the lung," he proceeds as follows:

> "Observe, in the next place that this definition of mine excludes tuberculosis, for acute tuberculosis differs in many respects from phthisis, and especially in this respect, that it is invariably an acute disease. It comes on somewhat suddenly, often in the midst of apparent health, like an ordinary fever; it runs a febrile course; it deposits throughout the organism small miliary bodies, called tubercles, which, in the lung, almost never give rise to cavities, and at the end of six weeks or two months, it puts an end to life. Now, this is not a history of phthisis, and for reasons which I will not now stop to state, it has been of set purpose excluded from my definition. When I am told that the anatomical structure of the tubercle of acute tuberculosis differs in no material particular from the anatomical structure of the tubercle of chronic phthisis, I will reply that the anatomical structure of a morbid product can never be made the true criterion of the disease which produces it. For the true criterion of the nature of a disease lies in its life history, and not in the anatomical forms whereby it finds but a partial expression which may be shared by other and different diseases
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> "*The Modern Theory of Tuberculosis.*—Here it will be necessary for me to make a short digression, in order that I may bring before you in greater detail the modern theory of tuberculosis. This theory is based upon the brilliant researches of Dr. Robert Koch. He discovered in all tubercular and scrofulous consolidations, the microphyte, the tubercle bacillus. He discovered that this bacillus could be grown and multiplied outside the body; that by the inoculation of animals with the decendants of pure cultures of this microphyte, tuberculosis could be produced, and that from the acute tuberculosis thus engendered, other animals could be similarly affected. He went still further and he showed that in phthisis these tubercle bacilli were always present; that they were capable, through inoculation, of producing tuberculosis n animals, and that the tuberculosis so produced, could be propagated downwards for several successive generations. Here I must ask you to observe that the disease produced by the inoculation of tubercle bacilli is acute tuberculosis, and that there is no conclusive evidence to show that the disease which I have defined as phthisis is ever so produced. I do not deny that there is any close organic alliance between acute tuberculosis and phthisis, but I do earnestly contend that there is such a fundamental organic difference between the conditions of which they are respectively the expressions, that the advancement of our art requires that this difference should not be overlooked. Now this brilliant discovery of Robert Koch and the

theory based thereon, make it plain that there are two factors in the evolution of tuberculosis—the tubercle bacilli and the soil in which they grow. For it is certain that the tubercle bacilli will not flourish in every soil and that the soil which at one time has favored their propagation will at another time cease to do so.

"Phthisis, as I have defined it, does not consist in any specific action of the bacillus or of the products of its living action. It consists in the reaction and in the nature and character of the reaction of the tissues of the organism to the irritations which the bacilli and their products create. Now, organisms are different and they often respond very differently to the same irritations, and thus it happens that these tubercle bacilli give rise to products of irritation, and therefore forms of phthisis, which are different from each other, which have there origin in different states of constitution, which have a different assemblage and progression of symptoms, which respond differently to their environments, which pursue a different course and which issue in different structural results.

"*The Soil.*—Every bacillus implanted in the lung, produces by its irritations, at least two different forms of structural products, the fibroid or the pneumonic. If the fibroid dominates, the course of the resulting disease is slow and cold. If the pneumonic dominates, the course of the resulting disease is usually rapid and always febrile. And if the pneumonic product dominates, and if its elements are composed of rapidly growing and rapidly decaying epithelial-like cells, and if the masses produced by their agglomeration, assume a caseous character, there is developed a form of disease known as galloping consumption, which has an individuality of its own sufficient to distinguish it from every other form of phthisis. Now, if all these things are so, would it not be infinitely better for us to spend less of our time in what seem vain attempts to destroy these microphytes, and more of our time in studying the character of the soil in which they will or will not grow? For all my experience points to the conclusion that it is mainly, if not entirely, through the influences which we may become able to exert upon the soil, that we may best hope to control or to stay the progress of phthisis.

"*Scientific Retrogression.*—Now, as the structural products of tubercular bacillary irritation in the lung vary in form and structure, and as each vaiety has a different life-history from the other, and as these life-histories are most diverse, I regard it as a most scientific retrogression to slump them together and obscure their organic distinctions in one name; for if it be just to say, and I contend that it is, that these varieties of phthisis differ in their origin, in their course, in their complication, in their response to their environments, in their duration and in their issues, then surely it is not merely just but necessary to the progress of our art that they should be separately recognized and separately named.

"*Non-bacillary Phthisis.*—I have one thing more to say. It has been alleged by Koch, and it is generally believed in London, that every case of phthisis, as I have defined it, is microbic, is associated with and dependent upon the presence and the action of tubercle bacilli. For my own part I presume to deny the allegation, and to contend that whilst the great majority of cases of phthisis are bacillary, there is a considerable minority of cases which are non-bacillary, in which at no period of their history can bacilli be found. To this denial it is sometimes replied that if the bacilli were not there when you sought for them, they were there when you did not, or if they were very enthusiastic and proportionately polite they will say that you were unable to find them and that they were certainly there. Some years ago I had in my own wards three cases of what I designated as non-bacillary fibroid phthisis. I invited two or three of my more distinguished contemporaries to examine these cases and to demonstrate the existence of the tubercle bacillus in them. They failed and, justifying their failure, said, "These are quite exceptional cases and do not break down our generalisation;" but, gentlemen, it is just the exceptional cases of this kind that demand the most careful consideration. for although they do not bear immediately or greatly upon our practical clinical teaching, they bear sufficiently upon it to justify me in calling your attention to it at this time.

"Whilst it is certain that some cases of fibroid phthisis never become, in the modern sense, tubercular, it is equally certain that others do—that, in different words, the living soil becomes so altered in its characters that the tubercular bacilli become capable of growing and multiplying therein. Furthermore, hæmoptysis is not an unfrequent complication of fibroid phthisis, both in the bacillary and in the non-bacillary varieties."

We also abstract as follows from a recent lecture of A. G. Auld, M.D., of the Royal Infirmary of Glasgow, "On the Scope and Origin of Fibroid Phthisis." (See London *Lancet*, November 5th, 1892):

> "Many at the present time go so far as to affirm that phthisis is synonymous with a local tuberculosis in the lungs, and has no wider signification This limitation, be it observed, is not made in an arbitrary fashion or for the sake of convenience; far otherwise, for it is held that in all cases which can possibly fall under the designation of phthisis, or, in other words, in all cases which are characterized by the progressive destruction or excavation of a non-malignant pulmonary consolidation, the bacillus tuberculosis indubitably exists. Let it, they say, be conclusively shown that such a destructive lesion can arise and proceed which at no period throughout its whole course is associated with the tuberculous organism, and then the question of the identity of phthisis and pulmonary tuberculosis may be reconsidered. Now this demand, even granting it can be fulfilled. is excessive, for in the case of pulmonary inflammations or consolidations which at a certain period of their course happen to become contaminated with the tubercular bacillus, it is evident that the bacillus, not having originated the disease, can hardly lay claim to an undivided sway. Such, for example, are cases of fibroid phthisis in which the tuberculosis occurs as a late accident of the disease; and if such tuberculosis should be limited, undergo fibroid change, and not very materially alter the regular progress of the signs and symptoms of the malady, the scientific narrowness involved in denominating the affection a tuberculosis of the lungs becomes palpably manifest.
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> "In order to assist in the solution of this problem of phthisis and tuberculosis it becomes almost imperative at the present time that any case which possesses unusual features, such as the absence of bacilli from the sputum, with signs of much mischief in the chest, should be carefully noted. In particular, post-mortem examination of such cases should be thoroughly carried out, for the failure to find bacilli in the sputum during life is by no means conclusive as to their absence from the lungs. With this end in view, I submit a short account of a case which made a deep impression on all who had the opportunity of seeing it at the post-mortem examination, and the features of which during life have been pretty accurately obtained. * * *
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> "Without dwelling at length on this remarkable case, will it not at once be conceded that it affords a most striking illustration of the degree to which destruction of the lungs may proceed without the demonstrable presence of tuberculosis? What objections or arguments can be adduced against its non-tuberculous nature? Suppose it be said that tuberculosis may have existed at some time, but had become quiescent or disappeared. Now, if the tuberculosis had become quiescent, so would the symptoms of the disease, but the patient died of a disease other than tuberculosis. Again, seeing that the right lung was the seat of disease to begin with, how is it that not remains of old tuberculous disease were discovered in it? By no subterfuge can the conclusion be evaded that this was a case of non-tuberculous phthisis. And we are therefore warranted in believing that there are two varieties of fibroid phthisis—one which is either complicated with or originated by a tuberculosis, and another which is not associated with that neoplasm, or, in the words of the distinguished physician* who has done so much to elucidate this subject, there is a bacillary and a non-bacillary fibroid phthisis.

It is next to be borne in mind that because the bacillus tuberculosis can be inoculated, and so tuberculosis be reproduced, that this does not prove that it is an infectious or contagious disease in the usual acceptation of these terms.

In the opinion of some there needs to be additional proof that it can be communicated even in this way to man, because it can be so communicated to some lower animals. It has been said that "man is not a test-tube," and that "man is not a guinea-pig." Some minds are influenced by the fact that so many animals thus shut up die of septic disease and claim that in many, tuberculosis is likely to supervene

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*Lecture on Fibroid Phthisis, by Sir Andrew Clark, *The Lancet*, July 2d, 1892.

without either inoculation or a specific virus in the air. It is not very easy always to determine that a rabbit or a guinea-pig has no tubercular deposit anywhere before there is inoculation. We know how lightly and with what pity for incredulity such suggestions are brushed aside by many laboratory observers. But we also know that they are already confronted in other diseases with strange defects of observation and strange fallacies of conclusion, such as do not remove the practitioner from being a witness-bearer worthy of consideration.

The main point, however, is that stated by Professor Jacobi, at the Association of American Physicians, 1891, where he said "tuberculosis will not attack a healthy lung." In a discussion (N. Y. Academy of Medicine, January 7th, 1892), in remarks upon tuberculosis in children, he said, in substance, that very seldom does tuberculous phthisis arise without there previously being abraded or broken mucous membrane. Another has said that the history of a normal, healthy lung invaded by a bacillus tuberculosis and thus becoming tuberculous has yet to be written.

Some such hold that, in a lung whose walls are thin or abraded, or broken by some form of inflammation or irritation, this bacillus is especially prone to set up a destructive process, but that, although the most frequent, it is not by necessity the only cause of the disease. The fact that Cornet, in the Berlin Institute of Hygiene, in the case of 170 animals inoculated with dust from the living-rooms of consumptives, lost *91 of septic disease*, and claimed that 34 became infected by the bacillus, does not prove that consumption in the human being arises only from this bacillus, or that a healthy human lung would have been susceptible. As to his investigations and proofs of direct communicability through the inbreathing of dried sputum, as derived from the convents of the nursing orders of Prussia, it is notorious that these have long furnished, on general grounds of dampness, closeness, &c., breeding-places for diseases to which women from 20 to 60 are subject. Thus in the Ontario report, 1890, Dr. Bryce quotes Hirsch as follows: "Smith has ascertained that of 1,000 persons treated for consumption at the Brompton Hospital, 70 per cent. had been in the habit of spending their time in overcrowded, hot and dirty places indoors. The same circumstances seem to account for the strikingly common occurrence of phthisis in nunneries, seminaries and such institutions, in evidence whereof a number of observations have been brought forward by Foracault."

It may be well to note incidentally, in passing, that of late much more consideration is being given to the view that bacilli in general are not as stable and inevitable in their characteristics and conduct as we were generally taught not very long ago. It is true that this is not generally asserted as to the bacillus tuberculosis, but such a criticism as this it is well to bear in mind. "Sir Hugh Beevor's research shows 'that the tubercle bacillus will grow outside the animal body at ordinary temperature in Europe.' 'The bacillus tuberculosis is a saprophyte on occasion.' Koch's doctrine 'that tuberculosis is an exquisitely infectious disease is built upon the assumption of the strictly obligate parasitism of the bacillus.'" (See articles by Dr. Candler, Melbourne, Vic., in *London Lancet*, September, 1891, &c.)

This subject of the parasitic origin of disease as modified by change in form, or character, or product, or virulence, or by environment, we will have occasion to study more fully elsewhere.

There is the most pressing occasion that in speaking of phthisis pulmonalis as contagious we should not use such words as contagious, infectious, communicable, catching, without giving some very accurate information as to what we mean thereby.

The first utterances in this direction were dictatorial and dogmatic. They were in substance thus:

"The bacillus tuberculosis is the only cause of phthisis. A consumptive person will expectorate from one to twenty-one millions of these per day, and each one of these, when dry and inhaled, is likely to produce consumption. While we can and ought to do much by way of preventing the drying of any speck of sputa with the long sicknesses from this disease and with one-seventh of the race dying of it, and with all the imperfect care of tens of thousands each year, we cannot expect but that much of the material will thus become dried and disseminated. Besides, we cannot say how many of these bacilli other secretions may contain; therefore this disease is very actively contagious." Such was and with many still is the intensity of this doctrine of contagion. It would not always take just this form, but in fact both the medical and the public press have made unlimited statements. Health Boards, both city and State, spread their rules broadcast. It was not merely the wise direction as to care of sputa. For years, it may be, the consumptive must be in a room without furniture, carpets, rugs, hangings, &c. His eating utensils must be washed separately in boiling water as soon after eating as possible. If now and then he ventured to the family table the boiling water must be ready at hand in order to immerse them. The sputa must be disinfected, although as Dr. Kinnicutt (Middleton-Goldsmith lecture, 1892) puts it, "Results indicate in the most positive manner that we possess no practical means at present for efficiently disinfecting sputum by chemical disinfectants." His garments must be put in boiling water separately. For other purposes he must have separate utensils. He must sleep in a separate room. No other animals or birds must come near him. Whatever the circumstances of the family the floors, walls and ceilings of the living and sleeping-rooms must be *thoroughly cleansed every two weeks* or oftener No rules of ordinary cleanliness, airing, sunlight and nurse-care will suffice. This is from the New York City rules alone.

What a joy when the bacillus itself was declared not to be "immortal," and even Koch announced that sunlight would quickly kill it, and ordinary daylight in a few hours. Even though thus late, how pleasant to read from notable physicians (see New York Academy of Medicine, January, 1892), thus:

The President, Prof. A. L. Loomis, said that while all the speakers admitted the contagiousness of phthisis, yet to use this term without explanation would be liable to convey to the public the idea that they were in as great danger of contracting this disease as scarlet fever or small-pox, which they also knew to be contagious. It was necessary, therefore, to educate the people regarding the extent and manner in which tubercular phthisis was contagious, and not to unduly frighten them. Regarding prevention, he thought the keynote had been struck a number of times during the discussion: it was, in its simplest form, cleanliness. As Dr. Johnson had said, people should be taught that all expectoration was nasty. No gentleman would spit in public. He might find it necessary to use his handkerchief, but he would not be seen expectorating. Teach the people to bathe, to wear clean clothes, to keep their houses clean, to get fresh air.

Dr. A. H. Smith said there were two factors to be taken into consideration, one being the seed and the other the soil.

Dr. Roosevelt said "the question which we had to consider was not the dealing of medical men with sick people, but impressing the public with the duty of simple cleanliness in its most complete form throughout the house. The people should be taught not only to disinfect sputum and to observe cleanliness to its fullest extent, but also the reason why. It was largely a question of ventilation and cleanliness." Prophylaxis does not all center about the bacillus, and Dr. Fox, in his excellent work, after the fullest recognition of the relations of this microphyte to the disease, after speaking of the importance of climatic conditions, is able to say: "I believe, however, that the most efficient prophylaxis for phthisis in the future, as in the past, will be found in increasing attention to the sanitary condition of dwelling-houses and workshops, though the discovery of unhealthy conditions, masked as they occasionally are, is sometimes even more difficult in the homes of the wealthy than in houses of less size and pretension."

While emphasizing all practicable care of sputum, we would never in official utterances speak of this disease as contagious without explanation of its position as distinct from small-pox, scarlet fever, &c., and thus seek to show that in more than one direction this disease is in the range of limitation; this, too, without statements that logically demand leper-like isolation that represent a sole, indestructible cause, and that practically minimizes other factors as potent and to be recognized as to their effects. While we should impress what we really know, we should also remember that injury and reaction result from an attempt to enforce rules impracticable in practice, and not supported by sufficient data to make such exactions imperative.

What then, from this view, is the practical direction and advice which physicians are to give to the public, to families, to patients and their friends?

We shall mention several particulars, but not perhaps in the order of their importance.

We are still to teach that damp and ill-drained lands, certain climates, indoor or dust occupations, close living, bad air, deficient light and sunshine and uncleanliness in any form have to do with the liability to and prevalence of consumption

We are still to teach that heredity is one of the partnership causes of this disease. Hence, those whose parents have been consumptive are to be impressed with the need of special attention to physical vigor in early youth and on to adult life, and to be advised to choose outdoor occupations, and to avail themselves of all those hygienic conditions which are now well understood so often entirely overcome hereditary tendencies. When possible, those who have care of consumptive persons should not have a consumptive heredity.

There always should be early examination in suspected cases for the bacillus tuberculosis, especially for its diagnostic value. When found, patients or their friends should not be alarmed with the general word "contagious," but in detail be informed of prevalent views as to it. The sputum should never be allowed to dry, either in vessels or on cloths of any kind, but if possible be destroyed by fire, or, if not, be consumed in some acid mixture. The limitations to any possible risk from it should be stated and the best means of securing them.

In general there should be such methods of cleanliness and ventilation as will avoid the need of enforced isolation, or of separate dealing with all clothing, utensils, &c., and many other details impracticable in prolonged diseases.

While emphasizing the importance of scrupulous care as to all sputa in tuberculosis, pneumonia, whooping-cough and a score of other diseases, we would not confine our attention to this one important item, but endeavor by hygiene and cleanliness and by all laws of care for the sick to withstand the several influences which promote the origin, invasion and extension of diseases of widespread prevalence.

PNEUMONIA.

Pneumonia, both by its prevalence and severity, is more and more attracting attention as to its etiology. It is not only that, in connection with influenza, the number of cases and the degree of fatality have increased, but for many years the suddenness of seizure and the number of cases and of deaths of apparently healthy persons in the vigor of life has enforced attention to it. This all the more because at times it has seemed to prevail as an epidemic. Twenty years since Dr. Leaming, of New York City, and a few others were contending that it was allied to contagious pleuro-pneumonia, and that the disease, at times, had a distinct epidemic character. Facts as to its microbic relations and its greater prevalence at distinct periods have led many to accept the view that it is a specific inflammation dependent upon a specific cause. Thus, in a recent debate in the New York Academy of Medicine, January, 1892, we have the following comments from two well-recognized authorities:

> "Dr. A. H. Smith thought the same rules applied with regard to infectiousness in pneumonia as in phthisis. In lobar pneumonia we had a specific disease, one due to a specific microbe, and the question of contagiousness was a question of the transplantation of that microbe from one individual to another. It might be possible for the transference to take place immediately by passage of the microbe from the sick to the well through the air, but more likely it usually took place, as in phthisis, by dried sputa floating in the air. The danger was less where but one patient was sick and was confined to a single room. It was much greater in a hospital where there were constantly many patients.
>
> "Dr. H. M. Biggs recalled bacteriological studies of a German made three or four years ago, which revealed pneumococci in the sputa and dust upon the floors in hospital wards."

Dr. Wilson Fox, in his recent work, speaks thus:

> "It can hardly be held that acute pneumonia, in its ordinary manifestations, is a common inflammation; a blood state, either engendered within or without the body, is absolutely necessary to explain its occurrence. Its main characters are those of a general and not of a local disease."

Again, after comparing the causation of pneumonia with that of typhoid fever and diphtheria, he says:

> "To sum up this subject, I believe that the evidence at present existing tends to show that pneumonia may arise from miasmatic influences of the pythogenic kind, and that it is very possible that this may be the origin of a large proportion, if not the whole, of the cases of acute primary pneumonia."

The account of Dr. Parsons, Her Majesty's Local Government Board, 1890, of an epidemic at Scotter, says: "The distribution of cases was certainly such as to suggest a local cause."

The present state of discussion and opinion as to it is so well presented in an editorial of the London *Lancet*, April 2d, 1892, that we quote the most of it:

> "The pathology of pneumonia is one of the *quæstiones vexatæ* of medicine. The disease has so many points of resemblance, on the one hand, to the specific fevers, and, on the other, to acute pulmonary affections, that the determination of its true patho-

logical relations is a most difficult and complex problem. The question at issue becomes still more interesting when we remember that, not only has pneumonia been a puzzle to the pathologist, but its treatment has been one of the great controversies of therapeutics. We naturally turn for light on these subjects to such a work as the exhaustive 'Treatise on Diseases of the Lungs and Pleura,' by the late Dr. Wilson Fox. 'Two opposite theories,' the author informs us, 'have been advanced regarding the origin of pneumonia, both of which are supported by certain facts and opposed by others—(1) That pneumonia is a "specific" fever, of which the disease in the lungs is only a local effect; and (2) that it is a purely local disease, of which the pyrexial and other phenomena observed are only the immediate consequences.' In favor of the first view are the following facts—(*a*) negatively, the absence in a large proportion of cases of any discoverable cause likely to excite inflammation of the lungs, and (*b*) positively, the suddenness of the onset of the disease, its well-defined course, its occasional epidemic and contagious character, the presence of bacteria in the blood, and the frequent appearance of a cutaneous affection (herpes), possibly analogous to the rash of the exanthemata. A point corroborative of the above is the well-known want of synchronism between the clinical progress of the case and the pulmonary condition. Thus, it is very common for the temperature to fall to normal and all the symptoms to abate, while the physical signs of pulmonary consolidation remain practically unchanged. Less frequently, but still not very rarely, the consolidation may show signs of resolution before there has been any abatement of the clinical symptoms.

"The above evidence seems strong, and if we confined our attention to it we might conclude with some confidence that pneumonia must take its place among the 'specific' diseases. But, unfortunately, there are some points of great weight that tell against this view. Thus, pneumonia is only very exceptionally epidemic, and its contagiousness, although held by some good observers, is still doubtful. Again, the influence of season is very apparent. * * * It seems impossible to resist the evidence that the frequency of pneumonia is much influenced not only by season, but by weather, cold winds, and sudden changes of temperature predisposing to it. In this regard, pneumonia shows an affinity with pulmonary disease and other affections that are admittedly due to 'chill.' * * *

"Summing up the subject, Wilson Fox wrote: 'The theory of a "specific" cause can scarcely be maintained for pneumonia in the same sense as that in which the term is employed for the contagious pyrexial diseases. The causes of pneumonia are manifold, and the disease may originate under such diverse conditions that it seems impossible to attribute it to any single blood poison. On the other hand, the most probable hypothesis to explain its origin is that of an altered composition of, or the existence of some morbid material in, the blood, which, from its special qualities, may affect a particular organ, or, as is more probable, may, under local predisposing causes, excite inflammation in that part of the system which in any given individual is the most liable to suffer, as a *locus minoris resistentiæ*.' We have no knowledge of the nature of the changes in the blood that predispose to pneumonia. The excess of fibrine that has been described has been shown by Virchow to be the consequence, rather than the cause, of the pulmonary inflammation. In some cases, no doubt, pneumonia is due to septicæmia, but this is not at all probable of the typical acute disease.

"It is rather a curious circumstance that while theoretical considerations and clinical evidence seem at present inadequate to fix definitely the pathological relations of pneumonia, the response of pathology and bacteriology is also somewhat equivocal. It is true that the researches of the bacteriologist of late years have considerably advanced our knowledge of this part of the subject. From them we learn that the microbe most constantly present in pneumonic exudation, and in that of the inflammatory affections with which pneumonia is often complicated, is the diplococcus discovered by Fraenkel and Weichselbaum; whereas Friedländer's bacillus, like some other microbes occasionally found in pneumonia, is of exceptional occurrence. Nor must the remarkable investigation of the two Klemperers upon the toxines of the first-named organism be lost sight of, as affording additional proof of the specificity of the disease. Nevertheless, when all these contributions to knowledge are collated, it would still seem that much remains to be done before we are in a position to conclude that bacteriology has said its last word regarding pneumonia.

> "According to Wilson Fox 'the disorder which, on a lesser scale, presents the greatest analogy with acute pneumonia is perhaps acute tonsillitis, where we have the same short initial stage, a similar intensity of rigor and prostration, a similar sudden invasion of pyrexia, and a similar rapid decline of this before the local inflammation has shown any signs of abatement. In tonsillitis, also, we have frequently an equal difficulty with pneumonia in verifying a distinct cause, and a certain amount of evidence at least exists is the case of the so-called "hospital sore-throat," that it may also be produced by other poisons than those originating within the system from the impeded exercise of the function of the skin.' It will thus be seen that the pathology of pneumonia remains a question *sub judice*, but that the best authorities incline more and more to the specific theory of its origin."

Prof. W. H. Welch, of Baltimore, regards the diplococcus pneumoniæ as the organism which is the cause of acute lobar pneumonia. This is now generally conceded. "It was discovered in September, 1880, by Sternberg, in his saliva and was next described in December of the same year by Pasteur." Note that it was found in the usual saliva of a healthy person. Professor Welch does not regard the pneumococcus of Friedlander as having anything to do with acute lobar pneumonia. (See *N. Y. Medical Record*, May 21st, 1892.)

With our present light, it seems best that the sputum of pneumonia should be cared for like the sputum of other diseases, and that renewed caution should be taken as to those exposures and conditions which seem either to cause or favor the prevalence of this disease. Because any one cause is proven this does not prove that there may not be other causes also. The remarks of Sir Joseph Fayrer, in his address at the Congress of Hygiene, London, 1891, are both conservative and true:

> "It must be remembered that, important as are the researches into microbiology, there are other factors to reckon with before we can hope to gain a knowledge of the ultimate causation of disease. It is not by any one path, however closely or carefully it may be followed, that we shall arrive at a full comprehension of all that is concerned in etiology and prevention, for there are many conditions, dynamical and material, around and within us which have to be considered in their mutual relations and bearings before we can hope to do so; still, I believe we may feel satisfied that the causes of disease are now being more thoroughly sought out than they ever have been—all honor to those who are prosecuting the research so vigorously—and that though individual predilection may seem sometimes to dwell too exclusively on specific objects, yet the tendency is to investigate everything that bears upon the subject, and to emphasize all that is implied in the aphorism, *Salus populi suprema lex.*"

CANCER.

It is natural and proper that, amid the many discussions of the origin of disease and especially as to the relation of micro-organisms thereto, so formidable and frequent a disease as cancer should come in for a large share of notice. This is especially proper, because it is conceded that it seems to be upon the increase. Besides the cancer bacillus of Scheuerlen, there have been other forms that have been supposed to account for its origin. For instance, about two years since Dr. W. Russell communicated a very able paper, with illustrations, to the Pathological Society of London, in which he described an organism belonging to one of the yeast or sprouting fungi. These are sometimes called fuchsin bodies. At the same time Mr. Shattack and Mr. Ballance contended that it was not due to a microbe, but might result, from the activity of one of the protozoa. Mr. Jonathan Hutchinson contends that cancer is not due to any special material introduced into the body from without, but is simply a modification of what occurs in chronic inflammation. Dr. Wm. K. Sibley read a paper on the non-contagiousness of cancer and accounted for various cases which were supposed to illustrate its contagiousness.

Dr. Woodhead has recently spoken as follows:

> "It must be accepted for the present that malignant tumors were to be looked upon as overgrowths of certain tissues started into activity by some unknown cause. What could be the exciting cause? It was necessary that there should be a continuous irritation, and one capable of multiplication. Hitherto few irritants had been found capable of keeping up continuous irritation for any length of time, and such as had been met with were confined almost entirely to those vegetable parasites which specially affected the connective tissues. Up to the present comparatively few parasitic vegetable organisms had been found that had the faculty of living in any of the active epithelial cells of an animal; these cells were usually described as offering a most determined resistance to the entrance of most vegetable micro-organisms. Numerous observers had thought they had succeeded in demonstrating the presence of specific vegetable micro-organisms in epithelial growths; but these, in most cases, had been proved to be merely common saprophytic organisms. Dr. Woodhead then referred to the controversy respecting the organism known under the name of 'coccidium,' which occurred in the liver of the rabbit and which was known to set up a peculiar irritated condition of the bile ducts, which ended in the formation of psorosperm nodules. One could not but be struck by the very marked similarity between psorosperm nodules and cancerous growths. The so-called fuchsin bodies found by Russell were then referred to. The lecturer concluded, however, that we were very far from having proof that these bodies were the actual cause of cancer. Why should they make themselves felt only under certain conditions, and at certain periods of life? He remarked that a coccidial theory of cancer, if proved, would render it necessary that we should throw aside the doctrine that cancerous epithelium could be developed from anything but epithelial cells."

The facts in evidence as to its hereditary character still continue to have frequent illustration, although, as with some other diseases, not without attempts to prove it to be only of microbic origin. There certainly seem to be some instances in which benign growths have suddenly become malignant.

We are compelled still to regard the disease as one on which pathology and biology have thrown no very illuminatting light. Our statistics as to cancer are less satisfactory than as to most other diseases, as we are often able to detect the use of its name as a term for various morbid growths, and to find some localities and some practitioners as reporting an excess of cases not to be accounted for by accuracy of nomenclature. While not able to throw any valuable light upon the prevention of this disease, we at least seek for more careful diagnosis or for some detail of secondary symptoms where the cause of death is not clear.

SMALL-POX.

Previous to the statistical year, reaching from July 1st, 1891, to July 1st, 1892, we have not had to record a single death from small-pox for two years and only seven for the two years previous to these. Just previous to that, cases had been rare in the State. During the past year the disease has been somewhat prevalent in Trenton and Newark, with scattered cases elsewhere. It is still occurring in some of our cities. The fact that, unless largely epidemic, it does not excite panic as heretofore sometimes leads to neglect of the earliest cases. While there is always a stir on the part of Health Inspectors there is sometimes delay in active measures the first few hours.

From the fact that we are coming to have Italian and Russian quarters, &c., in our cities we are more likely to have occasional cases of this troublesome disease. The only remedy is the most thorough isolation and vaccination and re-vaccination of all exposed persons, and a more thorough carrying out of vaccinatton on a systematic plan when there is none of the disease prevailing. Our school law and the section as to vaccination, in Chapter 68, Laws of 1887, gives large powers to Boards of Education and School Trustees in connection with Local Boards of Health. But children should be reached before school age. It would greatly aid to this if our new State Department of School Census would record the number in each family of any age who have not been vaccinated, and if then Local Boards of Health, in conjunction with physicians, would issue special notices and give special facilities, besides looking up these cases.

There is no longer need to argue the efficiency of vaccination, which has been so plainly set forth in our various reports.

The following statistics, furnished by the Local Government Board of England, as to an epidemic of small-pox at Sheffield, in 1890, are illustrative:

"In his introduction to this report, Sir George Buchanan states that in children under 10 years of age the attack-rate and death-rate per 1,000 were as follows:

"The attack-rate of the vaccinated	5 per 1,000
"The attack-rate of the unvaccinated	101 per 1,000
"The death-rate of the vaccinated	.09 per 1,000
"The death-rate of the unvaccinated	44 per 1,000

"Under the general circumstances of the Sheffield epidemic, therefore, the vaccinated children had, as compared with the unvaccinated children living in the town, a 20-fold immunity from attack by small-pox, and a 480-fold security against death by small-pox. A consideration of the attack-rate and death-rate amongst children in invaded households gives substantially the same results. Concerning persons over 10 years of age, Dr. Barry shows the attack-rates and death-rates to be as follows:

"The attack-rate in persons twice vaccinated	3 per 1,000
"The attack rate in persons once vaccinated	19 per 1,000
"The attack-rate in persons not vaccinated	94 per 1,000
"The death-rate in persons twice vaccinated	.08 per 1,000
"The death-rate in persons once vaccinated	1 per 1,000
"The death-rate in persons not vaccinated	51 per 1,000

"So that the twice-vaccinated persons over 10 years of age, as compared with the unvaccinated persons of the same age, had a 31-fold immunity against attack by small-pox, and a 640-fold security against death by small-pox. Apart from re-vaccination in people over 10 years of age, if vaccinated at all, there was a 5-fold immunity against attack by small-pox and a 51-fold security against death by small-pox, compared with the unvaccinated people of the same age. Figures such as these speak for themselves, and conclusively show that vaccination and re-vaccination are a most valuable safeguard against attack by small-pox. But the full protection to the community afforded by vaccination has only been acquired gradually, and that after compulsory powers for its enforcement were obtained. A reference to a report of the Registrar-General shows that the relative number of deaths from small-pox has decreased in proportion to the amount of pressure exercised for the performance of vaccination. He shows that during three periods—

"1. Vaccination optional, 1847-53; 305 deaths per million of population.

"2. Vaccination obligatory, but not efficiently enforced, 1854-1871; 223 deaths per million.

"3. Vaccination obligatory, and more efficiently enforced by Vaccination Officers, 1872-1880; 156 per million.

"These figures show conclusively that coincidently with the gradual extension of the practice of vaccination, there has been a gradual and notable decline in the mortality from small-pox at all ages."—*Public Health.*

Since the calf lymph has come into extensive use there is no longer a claim that there is danger from the diseases of other persons, nor has any objection arisen of a serious nature or of a sentimental kind against the use of bovine virus.

The experience of the German army seems to prove the value also of a general system of re-vaccination, which it now made obligatory. The advice of the Local Government Board of England is that all children that were vaccinated when infants be re-vaccinated when 12 years of age. Both knowledge and experience show that small-pox ought to be completely stamped out and could be retired from the list of human diseases. Yet its ravages upon individuals and communities are still serious. In view of the present tendencies to its prevalence, we urge that all our Local Boards institute special plans for thorough general vaccination at once.

ENTERIC, OR TYPHOID, FEVER.

Typhoid fever continues to be among the most serious of prevalent diseases. Its diffusion by water-supplies and by excremental filth will continue until our laws as to dealing with each are more exact, or until physicians, Health Inspectors and Local Boards are more on the alert in enforcing cleanliness, or in dealing with first cases.

There are many who believe that the disease sometimes arises under the laws of degradation and evolution without a previous case, but nevertheless it is true that in nearly every case the disease has been conveyed from some other person through a foul and ready propagating medium. The bacillus of Eberth is still its most likely *causa causans*, but when we remember that it is still often called on the Continent abdominal typhus, we need not wonder that all its diagnostic signs are not readily and positively settled. It was not, indeed, until 1850 that Sir William Jenner so closely described its lesions as to separate enteric fever from typhus fever. (See McVail, Glasgow Lecture, *Lancet*, November,.1892.) We have recently, in our reports, fully set forth any advanced facts or views as to this fever, and here have only to emphasize the importance of preventing it by preventing its causes, most of which are well understood.

SYNOPSIS OF VITAL AND MORTUARY STATISTICS.

BY THE MEDICAL SUPERINTENDENT OF VITAL STATISTICS.

The following outline presents the comparative number of marriages, births and deaths, as follows:

Average for five years ending June 30th, 1883:

Marriages	8,539
Births	24,281
Deaths	21,981

Average for five years ending June 30th, 1888:

Marriages	10,067
Births	26,050
Deaths	23,952

This average after June 30th, 1885, was on an increased population of 146,917.

The marriages occurring in Camden and other places, as a result of the Pennsylvania law, so far as known, are not counted in our reckoning, although necessarily recorded. The excess, as we have it, is as follows:

1886	2,527
1887	4,332
1888	4.557
1889	4,187
1890	3,411
1891	3,767

The following is the record for the year, from July 1st, 1888, to June 30th, 1889:

Marriages (including 4,072 non-residents)	15,726
Marriages of non-residents	4,072
Births	29,099
Still-births	1,817
Deaths	26,543

The record from July 1st, 1889, to July 1st, 1890, is as follows:

Marriages (including 4,187 non-residents)	15,564
Marriages of non-residents	4,187
Births	30,103
Still-births	1,799
Deaths	28,530

The population of the State in 1880 was 1,131,116; in 1885, 1,278,133, and in 1890, 1,444,933.

The following is the record for the year, from July 1st, 1890, to July 1st, 1891:

Marriages (including 3,411 non-residents)	15,305
Marriages of non-residents	3,411
Births	28,882
Still-births	1,795
Deaths	28,840

The following is the record for the year, from July 1st, 1891, to July 1st, 1892:

Marriages (including 3,767 non-residents)	16,082
Marriages of non-residents	3,767
Births	30,627
Still-births	1,826
Deaths	32,685

Comments and Comparisons.

The following table shows the average number of deaths from each of the principal causes, from July 1st, 1878, to July 1st, 1888:

YEARLY AVERAGE OF DEATHS FROM PRINCIPAL DISEASES FOR TEN YEARS, BEGINNING JULY 1ST, 1878.

Remittent Fever	289
Typhoid Fever	579
Small-Pox	71
Scarlet Fever	610
Measles	135
Whooping-Cough	161
Diphtheria	1,280
Erysipelas	101
Diarrhœal Diseases	2,592
Consumption	3,182
Acute Lung	2,438
Brain and Nervous Diseases of Children	1,762
Diseases of Heart and Circulation	1,313
Renal and Urinary Diseases	753
Adult Brain and Spinal Diseases	1,405
Adult Digestive and Intestinal Diseases	1,096

Cancer	482
Acute Rheumatism	75
Puerperal	245

DEATHS FROM VARIOUS CAUSES FROM JULY 1ST, 1888, TO JULY 1ST, 1889.

Remittent Fever	203
Typhoid Fever	724
Small-Pox	3
Scarlet Fever	533
Measles	118
Whooping-Cough	278
Diphtheria	1,574
Erysipelas	114
Diarrhœal Diseases	3,377
Consumption	3,449
Acute Lung	2,862
Brain and Nervous Diseases of Children	1,923
Diseases of Heart and Circulation	1,786
Renal and Urinary Diseases	1,056
Adult Brain and Spinal Diseases	1,791
Adult Digestive and Intestinal Diseases	1,450
Cancer	579
Acute Rheumatism	117
Puerperal	254

DEATHS FROM VARIOUS CAUSES FROM JULY 1ST, 1889, TO JULY 1ST, 1890.

Remittent Fever	195
Enteric or Typhoid Fever	782
Small-Pox	0
Scarlet Fever	209
Measles	174
Whooping-Cough	371
Diphtheria and Croup	1,575
Erysipelas	81
Diarrhœal Diseases	3,527
Consumption	3,669
Acute Lung	3,804
Brain and Nervous Diseases of Children	2,032
Diseases of Heart and Circulation	1,945
Renal and Urinary Diseases	1,149
Adult Brain and Spinal Diseases	2,308
Adult Digestive and Intestinal Diseases	1,521
Cancer	640
Acute Rheumatism	106
Puerperal	250

DEATHS FROM VARIOUS CAUSES FROM JULY 1ST, 1890, TO JULY 1ST, 1891.

Remittent Fever	180
Enteric or Typhoid Fever	695

Small-Pox	0
Scarlet Fever	288
Measles	250
Whooping-Cough	299
Diphtheria and Croup	1,737
Erysipelas	85
Diarrhœal Diseases	3,191
Consumption	3,456
Acute Lung	4,101
Brain and Nervous Diseases of Children	2,029
Diseases of Heart and Circulation	1,960
Renal and Urinary Diseases	1,200
Adult Brain and Spinal Diseases	2,333
Adult Digestive and Intestinal Diseases	1,573
Cancer	642
Acute Rheumatism	76
Puerperal	296

DEATHS FROM VARIOUS CAUSES FROM JULY 1ST, 1891, TO JULY 1ST, 1892.

Remittent Fever	198
Enteric or Typhoid Fever	628
Small-Pox	38
Scarlet Fever	1,008
Measles	197
Whooping-Cough	163
Diphtheria and Croup	1,776
Erysipelas	94
Diarrhœal Diseases	4,043
Consumption	3,575
Acute Lung	5,184
Brain and Nervous Diseases of Children	2,242
Diseases of Heart and Circulation	2,183
Renal and Cystic Diseases	1,444
Adult Brain and Spinal Diseases	2,457
Adult Digestive and Intestinal Diseases	1,625
Cancer	688
Acute Rheumatism	100
Puerperal	282

The population of the State, census of 1880, was 1,131,116; in 1885, 1,278,133, and in 1890, 1,444,933.

(For comparison, reckon the first quinquennial on the population of 1880, the second on that of 1885, and that of 1889 on estimated population. For 1890 we have the national census, and for each year since the population as estimated thereupon.)

A comparison of death-rates is one of the legitimate uses to be made of vital statistics, if only all the conditions which make such comparisons informatory as to the retations of health, disease and death are fulfilled. Even if not fulfilled, approximations are of value if only they are recognized at their true worth.

NUMBER OF MARRIAGES, BIRTHS AND DEATHS,

BY COUNTIES, CITIES AND TOWNSHIPS, AND TOTALS FOR THE STATE, FOR THE YEAR ENDING JUNE 30TH, 1892.

ATLANTIC COUNTY.

	M.	B.	D.
Absecon	6	15	11
Atlantic City	197	271	304
Buena Vista	3	20	18
Egg Harbor City	22	44	30
Egg Harbor Township	28	74	69
Galloway	13	47	41
Hamilton	16	31	18
Hammonton	31	78	60
Mullica	1	10	16
Weymouth	....	7	3
	317	597	570

BERGEN COUNTY.

	M.	B.	D.
Boiling Spring	2	43	29
Englewood	42	65	39
Franklin	21	49	85
Harrington	18	44	81
Hohokus	18	40	44
Lodi	45	153	38
Midland	9	40	31
New Barbadoes	67	141	113
Orvil	6	25	25
Palisade	24	53	43
Ridgefield	32	34	34
Ridgewood	10	31	85
Saddle River	14	59	31
Union	21	51	69
Washington	16	70	48
	345	898	795

BURLINGTON COUNTY.

	M.	B.	D.
Bass River	6	27	18
Beverly	24	28	94
Bordentown	32	84	130
Burlington	75	138	182
Chester	26	78	77
Chesterfield	5	10	31
Cinnaminson	50	98	56
Delran	17	69	44
Eastampton	2	8	9
Evesham	4	40	18
Florence	6	46	46
Lumberton	7	25	33
Mansfield	8	45	29
Medford	14	81	35
Mount Laurel	1	25	17
New Hanover	12	15	43
Northampton	55	94	132
Pemberton	18	10	63
Randolph	2	11	4
Shamong	6	16	8
Southampton	18	29	20
Springfield	4	16	20
Washington	....	7	4
Westampton	....	1	5
Willingboro	1	10	10
Woodland	....	....	6
	389	956	1,134

CAMDEN COUNTY.

	M.	B.	D.
Camden City	*4,284	1,264	1,534
Centre	6	54	44
Delaware	....	28	21
Gloucester City	58	108	159
Gloucester	20	82	118
Haddon	48	86	60
Stockton	54	149	138
Waterford	20	78	54
Winslow	10	84	39
	4,495	1,878	2,171

* Marriages of non-residents, 3,423.

CAPE MAY COUNTY.

	M.	B.	D.
Cape May City	24	47	46
Dennis	23	52	35
Lower	18	56	32
Middle	24	43	49
Upper	18	36	41
	97	234	203

CUMBERLAND COUNTY.

	M.	B.	D.
Bridgeton	136	307	198
Commercial	13	70	27
Deerfield	19	34	29
Downe	5	24	20
Fairfield	10	42	22
Greenwich	1	2	17
Hopewell	10	27	27
Landis	87	147	160
Lawrence	6	41	22
Maurice River	12	53	82
Millville	116	263	174
Stow Creek	4	18	7
	419	1,028	785

ESSEX COUNTY.

	M.	B.	D.
Belleville	27	69	91
Bloomfield	53	189	114
Caldwell	33	54	52
Clinton	30	63	71
East Orange	87	238	210
Franklin	....	13	10
Livingston	9	17	15
Millburn	10	51	43
Montclair	69	223	130
Newark	1,710	4,927	5,641
Orange	152	541	473
South Orange	26	103	85
West Orange	20	79	91
	2,226	6,567	7,026

GLOUCESTER COUNTY.

	M.	B.	D.
Clayton	15	16	28
Deptford	20	49	85
East Greenwich	14	17	25
Elk	1	7	8
Franklin	9	25	30
Glassboro	30	64	44
Greenwich	13	42	36
Harrison	10	27	23
Logan	4	28	18
Mantua	12	18	26
Monroe	25	37	47
South Harrison	2	11	6
Washington	6	29	15
West Deptford	4	31	30
Woodbury	45	91	33
Woolwich	14	66	43
	224	558	497

HUDSON COUNTY.

	M.	B.	D.
Bayonne	84	516	452
Guttenberg	16	78	72
Harrison	22	266	253
Hoboken	635	1,628	1,241
Jersey City	1,256	3,451	4,633
Kearny	34	186	187
North Bergen	19	105	243
Town of Union	161	250	240
Union	5	94	55
Weehawken	2	45	73
West Hoboken	95	379	264
	2,329	6,998	7,713

HUNTERDON COUNTY.

	M.	B.	D.
Alexandria	3	17	14
Bethlehem	13	25	41
Clinton	28	41	54
Delaware	20	40	43
East Amwell	10	22	19
Franklin	15	18	17
Frenchtown	23	19	20
High Bridge	15	28	25
Holland	3	29	30
Kingwood	6	16	13
Lambertville	58	68	106
Lebanon	28	48	26
Raritan	33	71	38
Readington	23	33	41
Tewksbury	16	34	21
Union	6	3	15
West Amwell	7	9	11
	307	521	591

MERCER COUNTY.

	M.	B.	D.
East Windsor	32	35	61
Ewing	2	12	96
Hamilton	20	31	147
Hopewell	21	47	48
Lawrence	3	23	31
Princeton	14	75	77
Trenton	*624	744	1,317
Washington	2	1	16
West Windsor	8	12	25
	726	980	1,812

* Marriages of non-residents, 34.

MIDDLESEX COUNTY.

	M.	B.	D.
Cranbury	24	40	38
East Brunswick	19	65	70
Madison	2	11	24
Monroe	19	12	54
New Brunswick	169	418	461
North Brunswick	4	24	18
Perth Amboy	106	181	244
Piscataway	23	62	63
Raritan	22	69	71
Sayreville	6	60	14
South Amboy	30	38	102
South Brunswick	17	43	41
Woodbridge	26	106	84
	467	1,129	1,284

MONMOUTH COUNTY.

	M.	B.	D.
Atlantic	6	15	32
Eatontown	22	23	36
Freehold	51	101	87
Holmdel	3	23	21
Howell	34	51	51
Long Branch	56	98	100
Manalapan	18	23	31
Marlboro	3	9	34
Matawan	16	62	57
Middletown	48	126	118
Millstone	7	27	31
Neptune	95	155	189
Ocean	9	23	12
Raritan	46	126	90
Shrewsbury	65	126	161
Upper Freehold	16	47	52
Wall	33	110	79
	528	1,145	1,181

MORRIS COUNTY.

	M.	B.	D.
Boonton	25	23	81
Chatham	41	25	34
Chester	9	27	24
Hanover	12	46	152
Jefferson	6	33	27
Mendham	11	23	24
Montville	5	8	21
Morristown	53	183	181
Mount Olive	17	29	26
Passaic	10	12	33
Pequannock	12	75	30
Randolph	71	143	140
Rockaway	22	123	86
Roxbury	24	66	65
Washington	9	41	33
	327	857	957

OCEAN COUNTY.

	M.	B.	D.
Berkeley	1	15	22
Brick	38	69	78
Dover	22	53	42
Eaglewood	7	8	7
Jackson	12	28	40
Lacey	3	8	18
Little Egg Harbor	6	43	38
Manchester	4	4	11
Ocean	3	12	16
Plumsted	6	37	48
Stafford	12	26	13
Union	8	20	10
	122	323	343

PASSAIC COUNTY.

	M.	B.	D.
Acquackanonk	13	50	41
Little Falls	11	71	26
Manchester	5	71	41
Passaic	130	309	332
Paterson	792	2,095	1,906
Pompton	25	35	41
Wayne	8	34	26
West Milford	16	22	38
	1,000	2,687	2,451

SALEM COUNTY.

	M.	B.	D.
Alloway	7	23	18
Elsinboro	....	....	1
Lower Alloways Creek	12	23	10
Lower Penns Neck	3	18	15
Mannington	8	10	36
Oldmans	6	28	20
Pilesgrove	28	50	53
Pittsgrove	19	57	25
Quinton	15	15	23
Salem	50	82	108
Upper Penns Neck	18	34	39
Upper Pittsgrove	8	23	15
	174	363	363

SOMERSET COUNTY.

	M.	B.	D.
Bedminster	10	36	33
Bernards	17	29	28
Branchburg	3	19	15
Bridgewater	83	172	192
Franklin	15	74	65
Hillsborough	19	25	47
Montgomery	10	14	27
North Plainfield	28	87	47
Warren	2	6	18
	187	462	472

SUSSEX COUNTY.

	M.	B.	D.
Andover	5	19	11
Byram	4	15	27
Frankford	6	20	34
Green	3	17	10
Hampton	1	1	10
Hardyston	17	20	31
Lafayette	9	6	10
Montague	3	1	11
Newton	27	85	38
Sandyston	14	7	8
Sparta	13	21	12
Stillwater	9	12	25
Vernon	5	9	25
Walpack	1	7	7
Wantage	28	40	61
	145	280	320

UNION COUNTY.

	M.	B.	D.
Clark	....	1	4
Cranford	20	38	23
Elizabeth	322	955	848
Fanwood	6	18	16
Linden	12	8	38
New Providence	4	5	15
Plainfield	121	223	208
Rahway	72	111	166
Springfield	7	14	20
Summit	24	62	50
Union	4	19	32
Westfield	16	47	49
	608	1,501	1,469

WARREN COUNTY.

	M.	B.	D.
Allamuchy	....	6	8
Belvidere	27	41	36
Blairstown	6	29	24
Franklin	14	15	28
Frelinghuysen	6	12	16
Greenwich	10	17	22
Hackettstown	19	41	52
Hardwick	1	8	4
Harmony	9	21	18
Hope	6	36	21
Independence	9	11	8
Knowlton	98	29	29
Lopatcong	1	20	27
Mansfield	10	16	26
Oxford	25	101	66
Pahaquarry	....	6	6
Phillipsburg	*361	210	131
Pohatcong	15	34	21
Washington	48	72	56
	655	725	598

* Marriages of non-residents, 260.

COUNTIES.

	M.	B.	D.
Atlantic	817	597	570
Bergen	845	898	795
Burlington	389	956	1,154
Camden	4,495	1,878	2,171
Cape May	97	234	308
Cumberland	419	1,028	735
Essex	2,226	6,567	7,028
Gloucester	224	558	497
Hudson	2,829	6,998	7,713
Hunterdon	307	521	591
Mercer	726	980	1,812
Middlesex	467	1,129	1,284
Monmouth	528	1,145	1,161
Morris	827	857	957
Ocean	122	323	343
Passaic	1,000	2,687	2,451
Salem	174	868	883
Somerset	187	462	472
Sussex	145	280	329
Union	608	1,501	1,469
Warren	655	725	598
	16,082	30,627	32,655

RETURNS OF DEATHS FROM ALL CAUSES

AND CLIMATOLOGY TABLES.

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892, by Counties.

COUNTIES.	DEATHS AT ALL AGES.													PRINCIPAL CAUSES OF DEATH.																				
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.*	Death-rate per 1,000.	Death-rate per 1,000 without cities of over 5,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic............	128	49	48	164	178	3	570	31,428	18.14	16.25	31.05	198	33.86	1	6	......	11	2	1	14	1	90	36	32	62	23	52	33	64	35	16	6	8	25
Bergen.............	182	83	68	245	210	7	795	50,164	15.85	....	33.33	247	28.14	8	12	......	27	1	1	29	1	81	46	41	124	55	59	37	59	49	18	4	6	57
Burlington........	210	129	146	267	374	8	1,134	58,916	19.25	17.42	29.89	439	28.71	4	31	......	24	6	5	140	2	110	56	61	155	57	97	53	98	60	22	3	2	53
Camden............	525	326	236	604	470	10	2,171	92,082	23.57	17.72	39.20	790	36.39	10	43	......	31	5	10	178	6	295	104	108	323	170	161	74	169	94	42	5	12	92
Cape May.........	43	11	12	53	80	4	203	11,476	17.69	....	26.60	54	26.60	......	1	......	4	......	2	3	1	22	8	18	29	8	22	5	22	20	9	......	......	6
Cumberland	153	48	84	213	231	6	735	46,820	15.70	14.89	27.35	252	34.29	......	22	......	18	5	......	21	1	77	46	62	93	38	69	34	70	34	24	3	4	26
Essex	1852	1135	651	2119	1252	17	7,026	273,030	25.71	15.36	42.51	2,751	39.15	48	171	14	348	94	27	309	21	923	447	354	1115	521	409	313	452	290	141	17	57	248
Gloucester	106	41	46	140	160	4	497	29,067	17.10	....	29.58	180	36.22	4	12	......	10	......	......	22	2	71	29	30	70	15	41	17	53	31	8	5	2	21
Hudson	2133	1255	705	2604	999	17	7,713	289,038	26.69	26.05	43.98	2,915	37.78	54	163	1	280	38	34	415	29	1047	466	388	1261	692	414	338	411	358	138	20	80	355
Hunterdon.......	67	43	64	166	249	2	591	35,355	16.72	....	18.61	149	25.21	2	5	......	12	2	6	34	1	23	29	35	114	24	53	24	77	34	22	4	4	34
Mercer.............	378	227	208	536	435	28	1,812	85,254	21.25	26.66	33.39	675	37.25	15	37	13	31	4	16	158	5	196	107	93	267	94	109	79	169	84	36	8	17	82
Middlesex	296	178	134	362	293	21	1,284	63,982	20.07	16.81	36.92	438	34.11	10	18	......	75	1	1	63	2	140	70	58	195	86	75	60	90	77	29	4	14	76

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* The population is estimated upon the increase from the State Census of 1885 to the National Census of 1890. Where there was a decrease the population of 1890 is given.

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892, by Counties—Continued.

COUNTIES. Statistical Divisions.	DEATHS AT ALL AGES.													PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.*	Death-rate per 1,000.	Death-rate per 1,000 without cities of over 5,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	Remittent, fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Monmouth.......	250	91	104	344	385	7	1,181	71,848	16.44	16.95	28.81	373	31.58	9	15	......	8	1	3	52	4	153	55	73	207	47	102	67	102	75	21	3	9	49
Morris..............	160	101	92	295	296	13	957	55,421	17.27	16.61	27.27	285	29.78	8	12	......	21	6	10	52	1	77	48	50	140	47	71	51	139	47	24	3	7	45
Ocean	62	25	29	90	135	2	343	16,198	21.18	....	25.36	119	34.69	......	3	......	7	......	......	18	1	38	23	29	46	12	29	17	31	24	9	2	3	10
Passaic..............	715	329	220	728	454	5	2,451	113,814	21.54	13.76	42.59	874	35.66	9	25	10	23	7	22	176	5	342	125	130	410	184	139	91	147	185	49	4	20	107
Salem................	90	22	31	90	128	2	363	25,151	14.43	12.99	30.85	115	31.68	1	5	......	10	......	......	9	2	48	20	20	58	16	37	15	43	21	9	2	2	10
Somerset...........	93	47	35	122	173	2	472	28,665	16.47	....	29.66	148	31.36	5	8	......	10	10	2	15	...	50	23	25	82	18	42	29	36	30	16	2	6	17
Sussex	58	19	24	83	130	6	320	22,259	14.38	....	24.01	79	24.69	......	6	......	1	......	12	6	1	19	11	23	76	11	26	8	39	19	12	1	5	10
Union.................	351	187	105	467	355	4	1,469	76,717	19.16	14.87	36.62	471	32.06	7	25	......	47	15	5	39	8	181	74	70	251	95	115	66	125	85	20	3	15	76
Warren...............	121	50	55	164	203	5	598	36,553	16.36	16.84	28.60	167	27.93	3	8	......	10	......	6	23	...	60	28	29	109	29	61	33	61	23	14	1	9	28
Totals	7973	4396	3097	9856	7190	173	32,685	1511653	21.62	17.27	37.84	11,720	35.86	198	628	38	1008	197	163	1776	94	4043	1851	1724	5187	2242	2183	1444	2457	1625	688	100	282	1427

* The population is estimated upon the increase from the State Census of 1885 to the National Census of 1890. Where there was a decrease the population of 1890 is given.

NOTE.—Under the heading "Number of deaths from chief preventable diseases," the first eleven diseases are classified, including consumption, male and female. Of those dying under one year, 2,236 died under one month, of which 1,600 died in the large cities. Of those dying under one year, 5,775 died in the large cities. Of the 12,369 that died under five years, 9,146 died in the large cities. Total death-rate from consumption for the State, as compared with the total deaths, 10.94; the deaths being 2,331 in cities, 1,244 outside. Rates for short periods, or which deal with small numbers, are only approximate, since temporary causes may have been in operation, and small numbers do not eliminate or balance errors, which practically disappear in larger aggregates. The number of deaths before twenty, in proportion to the rest, is much more informatory as to local causes affecting health than the total deaths. See, also, number dying from preventable diseases.

Return of Deaths from all Causes and Certain Specified Diseases, in the Cities of the State of New Jersey of over 5,000 Population, for the Year Ending June 30th, 1892.

CITIES HAVING OVER 5,000 POPULATION.	DEATHS AT ALL AGES.												PRINCIPAL CAUSES OF DEATH.																					
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic County.																																	
Atlantic City	*81	21	23	95	84	......	304	15,057	†20.19	33.55	99	32.57	......	4	...	3	......	1	8	1	59	11	12	27	14	34	18	32	20	11	4	5	14
Burlington County.																																	
Bordentown	13	17	26	28	46	......	130	4,232	30.72	23.08	57	43.85	......	4	...	......	......	......	30	1	10	6	6	26	4	8	3	5	7	6	...	......	5
Burlington	44	15	19	56	48	......	182	7,508	24.24	32.42	68	37.36	1	3	...	......	......	2	19	...	21	10	12	16	16	18	16	17	5	4	1	......	8
Camden County.																																	
Camden City	396	262	171	408	206	1	1,534	60,473	25.37	42.89	582	37.94	1	38	...	27	4	7	150	2	220	61	72	214	136	111	48	108	59	32	5	6	56
Gloucester City	33	17	17	58	33	1	159	6,802	23.38	31.45	52	32.70	3	1	...	1	......	......	6	1	19	12	9	27	8	7	7	10	6	3	...	1	21
Cumberland County.																																	
Bridgeton	42	14	22	63	56	1	198	11,966	16.55	28.28	71	35.86	......	9	...	7	......	......	10	...	16	13	16	26	12	13	12	18	8	6	...	2	7
Millville	48	14	18	46	47	1	174	10,472	16.62	35.63	79	39.66	......	4	...	2	......	......	3	...	30	11	19	20	9	23	8	6	8	3	1	1	7
Essex County.																																	
Newark	1520	975	507	1722	905	12	5,641	193,366	29.17	44.23	2,236	39.64	39	153	14	302	88	20	219	18	759	363	261	876	424	318	252	349	233	117	15	42	205
Orange	113	68	58	153	80	1	473	20,288	23.31	38.27	194	41.01	1	6	...	17	4	3	39	3	55	36	30	90	43	22	19	27	16	4	1	4	17
Hudson County.																																	
Bayonne	161	59	32	143	57	......	452	21,413	21.11	48.67	158	34.96	4	13	...	2	1	......	16	2	77	17	26	80	42	19	18	20	16	8	2	8	25
Harrison	61	37	32	91	30	2	253	8,950	28.27	38.74	110	43.48	7	4	...	20	......	......	8	3	33	24	11	33	24	5	8	13	13	4	1	4	12
Hoboken	321	213	104	428	171	4	1,241	46,018	26.97	43.03	505	40.69	3	15	...	40	7	6	70	8	190	93	73	160	102	89	65	48	64	22	2	7	68
Jersey City	1243	771	447	1623	540	9	4,633	166,799	27.78	43.47	1,723	37.19	31	123	1	185	25	24	261	12	573	260	228	812	418	230	203	257	216	92	18	54	199
Town of Union	82	43	22	52	41	......	240	11,541	20.80	52.08	78	32.50	1	2	...	7	1	......	12	1	36	10	8	43	32	15	4	11	11	5	1	......	5
Mercer County.																																	
Trenton	331	198	166	359	243	20	1,317	66,686	19.75	40.17	522	39.64	11	15	12	26	2	16	135	3	164	77	61	186	79	70	45	97	62	23	6	14	54

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* Probably due to infants brought to the city sick.

† This death-rate is calculated on the resident population, whereas the real population is often several times larger, and, on account of this floating population, the death-rate is not a criterion of health conditions.

Return of Deaths from all Causes and Certain Specified Diseases, in the Cities of the State of New Jersey of over 5,000 Population, for the Year Ending June 30th, 1892—Continued.

CITIES HAVING OVER 5,000 POPULATION. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	Deaths under five in each 100, or comparison of these with total deaths.	Number of deaths from chief preventable diseases.	Comparative number of deaths in each 100 from chief preventable diseases.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.						Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Middlesex County.																																	
New Brunswick	83	80	71	120	99	8	461	18,741	24.60	35.36	177	38.39	2	9	...	52	......	......	29	1	40	19	25	82	35	24	25	28	22	12	2	1	15
Perth Amboy	108	40	13	60	21	2	244	10,792	22.61	60.66	86	35.25	......	1	...	3	......	......	12	...	55	12	3	30	17	10	13	11	10	1	...	5	14
Monmouth County.																																	
Long Branch	24	8	9	38	20	1	100	8,067	12.40	32.00	38	38.00	1	3	...	1	......	......	2	...	18	6	7	10	4	9	4	7	4	7	...	......	4
Morris County.																																	
Morristown	37	21	17	59	47	......	181	8,702	20.80	32.04	59	32.60	1	3		8	3	2	5	...	19	11	17	27	13	8	5	9	15	5	2	1	7
Passaic County.																																	
Passaic City	120	48	22	103	37	2	332	14,908	22.27	50.60	135	40.66	2	10	5	......	......	3	23	...	63	11	18	46	16	16	11	16	22	4	...	3	11
Paterson	542	258	179	573	355	1	1,908	84,371	22.61	41.93	684	35.85	7	15	1	17	7	16	142	5	259	111	104	328	157	113	69	109	100	37	3	14	78
Salem County.																																	
Salem City	24	11	5	29	38	1	108	5,516	19.58	32.41	30	27.78	......	1	...	5	......	......	1	...	8	9	6	20	5	11	4	11	8	3	1	......	5
Union County.																																	
Elizabeth	238	137	54	270	149	......	848	40,022	21.19	44.22	276	32.55	5	11	...	38	11	......	18	6	118	33	36	154	74	51	41	53	41	14	1	11	45
Plainfield	46	12	13	73	63	1	208	12,207	17.04	27.88	61	29.33	2	3	...	3	2	......	5	1	23	13	9	30	7	29	10	27	9	5	1	2	11
Rahway	25	17	12	55	57	......	166	7,201	23.05	25.30	51	37.02	......	4	...	5	1	......	2	...	15	10	14	31	8	10	6	19	18	3	...	1	10
Warren County.																																	
Phillipsburg	39	15	12	30	26	......	131	8,887	14.77	41.22	44	33.59	......	3	...	3	......	1	8	...	20	4	5	23	10	12	8	9	5	3	...	1	5
Totals	5775	3371	2071	6744	3589	68	21,618	870,985	24.81	42.31	8,175	37.82	122	457	33	774	156	101	1233	68	2900	1243	1088	3417	1709	1275	922	1317	998	434	62	187	908

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

ATLANTIC COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Absecon	1	1	......	3	5	1	11	......	......	......	......	......	......	......	......	1	......	2	1	1	......	......	1	......	2	1	......	1	1	......
*Atlantic City	81	21	23	95	84	......	304	15,057	20.19	......	4	......	3	......	1	8	1	59	11	12	27	14	34	18	32	20	11	4	5	14
Buena Vista	3	2	1	8	4	......	18	......	......	......	......	......	......	1	......	......	......	3	4	1	2	1	2	1	......	1	......	......	1	......
Egg Harbor City	4	3	3	3	17	......	30	......	......	......	......	......	......	......	......	1	......	2	1	......	2	3	1	5	5	2	1	......	......	2
Egg Harbor Township	14	4	8	19	23	1	69	......	......	......	......	......	......	......	......	1	......	10	6	10	10	2	5	3	10	4	2	......	......	2
Galloway	6	6	6	10	12	1	41	......	......	......	1	......	7	......	......	3	......	4	1	2	3	......	2	3	5	2	2	......	1	1
Hamilton	5	2	3	2	6	......	18	......	......	1	......	......	......	1	......	......	......	1	3	2	4	1	......	......	1	1	......	......	......	1
Hammonton	11	10	3	19	17	......	60	......	......	......	1	......	1	......	......	......	......	6	7	4	11	2	5	3	5	2	......	1	......	5
Mullica	2	......	1	5	8	......	16	......	......	......	......	......	......	......	......	......	......	2	2	......	3	......	2	......	4	1	......	......	......	......
Weymouth	1	......	......	......	2	......	3	......	......	......	......	......	......	......	......	......	......	1	......	......	......	......	......	......	......	1	......	......	......	......
Totals	128	49	48	164	178	3	570	31,428	18.14	1	6	......	11	2	1	14	1	90	36	32	62	23	52	33	64	35	16	6	8	25

* This and all other cities that are health resorts may have an excessive death-rate by reason of temporary increase of population, which also includes a proportion of invalids above the average. Local Boards show this on their record.

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

BERGEN COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrheal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bolling Spring	11	5	5	5	3	......	29	......	......	1	......	......	2	......	......	2	......	8	1	1	1	5	......	2	4	......	......	1	......	2
Englewood	23	9	8	31	17	1	89	......	......	......	3	......	6	......	......	4	......	14	4	5	8	5	9	5	4	6	......	1	2	4
Franklin	6	4	1	10	14	......	35	......	......	......	......	......	1	......	......	3	......	5	......	3	11	......	5	1	4	......	1	......	......	......
Harrington	5	7	1	8	10	......	31	......	......	......	......	......	......	......	......	1	......	......	2	1	7	2	1	2	2	3	2	......	......	4
Hohokus	8	3	4	15	14	......	44	......	......	1	2	......	2	1	......	2	......	1	2	1	7	2	4	2	1	7	1	......	......	4
Lodi	21	9	9	29	20	......	88	......	......	2	......	......	5	......	......	5	......	11	5	6	17	5	7	4	4	4	2	1	......	3
Midland	5	3	3	9	11	......	31	......	......	......	......	......	......	......	......	......	......	1	5	8	1	4	1	2	5	......	1	1	......	2
New Barbadoes	20	8	8	40	37	......	118	......	......	1	1	......	......	......	......	4	......	8	9	7	20	11	6	6	10	8	2	......	1	12
Orvil	4	3	1	8	9	......	25	......	......	1	......	......	......	......	......	......	......	2	......	......	9	......	2	1	4	1	......	......	......	4
Palisade	9	4	3	13	12	2	48	......	......	1	......	......	......	......	......	1	1	5	4	4	2	8	8	1	1	4	2	......	......	5
Ridgefield	25	10	9	25	14	1	84	......	......	1	1	......	6	......	1	2	......	12	6	8	12	4	5	2	8	4	1	......	2	6
Ridgewood	8	2	2	14	9	......	35	......	......	......	2	......	1	......	......	......	......	2	1	2	6	2	2	2	6	4	......	......	......	8
Saddle River	11	4	2	8	6	......	31	......	......	......	3	......	......	......	......	......	......	5	1	1	8	2	1	3	......	1	1	..	......	......
Union	17	9	9	20	13	1	69	......	......	......	......	......	2	......	......	4	......	7	1	2	9	8	8	2	6	4	1		1	6
Washington	9	3	3	10	21	2	48	......	......	......	......	......	2	......	......	1	......	5	5	2	6	2	5	2	5	8	4		..	2
Totals	182	83	68	245	210	7	705	50,104	15.85	8	12	......	27	1	1	29	1	81	46	41	124	55	50	37	50	40	18	4	6	57

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

BURLINGTON COUNTY.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bass River	3	1	5	2	7	......	18	......	......	......	......	......	......	......	......	5	......	1	......	......	3	......	2	......	......	2	......	......	......	......
Beverly	12	16	16	20	30	......	94	......	......	2	4	......	2	......	......	23	1	6	1	8	13	2	7	......	6	3	1	......	......	5
Bordentown	13	17	26	28	46	......	130	4,232	30.72	......	4	......	......	......	......	30	1	10	6	6	28	4	8	3	5	7	6	......	......	5
Burlington	44	15	19	56	48	......	182	7,508	24.24	1	3	......	......	......	2	19	......	21	10	12	16	16	18	16	17	5	4	1	......	8
Chester	14	6	12	14	31	......	77	......	......	......	3	......	......	1	......	5	......	10	9	3	10	1	9	6	5	4	......	......	......	4
Chesterfield	7	3	5	7	9	......	31	......	......	......	......	......	......	......	1	6	......	2	......	1	2	4	2	3	2	2	1	......	1	1
Cinaminson	16	4	1	17	17	1	56	......	......	......	1	......	1	......	......	1	......	9	2	2	6	4	9	1	8	1	3	......	1	1
Delran	7	5	6	8	18	......	44	......	......	......	2	......	2	......	1	5	......	2	4	1	10	3	1	4	5	......	......	......	......	1
Eastampton	3	......	2	3	1	......	9	......	......	......	1	......	1	......	......	......	......	1	......	......	......	1	1	2	1	......	......	......	......	......
Evesham	6	1	2	4	5	......	18	......	......	......	1	......	......	......	......	2	......	4	1	1	......	......	1	1	1	2	1	......	......	1
Florence	6	8	11	9	12	......	46	......	......	......	1	......	3	......	......	4	......	2	3	3	9	8	2	2	1	1	3	......	......	3
Lumberton	7	5	1	6	18	1	38	......	......	......	2	......	......	2	......	1	......	4	......	1	6	3	1	......	3	5	......	......	......	2
Mansfield	8	1	4	4	12	......	29	......	......	1	......	......	1	......	......	1	......	1	2	2	5	1	3	1	3	2	......	......	......	......
Medford	7	1	5	9	11	2	35	......	......	......	......	......	2	1	1	......	......	5	3	8	6	......	2	2	2	3	......	......	......	2
Mt. Laurel	6	1	3	3	4	......	17	......	......	......	2	......	......	......	......	1	......	3	......	......	2	......	2	1	1	2	......	......	......	......

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

BURLINGTON COUNTY—Con.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
New Hanover	11	4	2	8	18	.....	43	.....	.....	.....	1	.....	.....	.....	.....	2	.....	8	3	3	10	3	5	1	4	2	.....	.....	.....	3
Northampton	22	26	16	31	35	2	132	.....	.....	.....	3	.....	6	1	.....	31	.....	17	3	9	12	.....	10	4	17	6	.....	1	.....	5
Pemberton	12	4	7	14	26	.....	63	.....	.....	.....	2	.....	.....	1	.....	2	.....	4	2	8	8	4	7	5	6	5	2	.....	.....	8
Randolph	.....	.....	.....	1	3	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	.....	.....	.....	1	.....	.....	.....	.....
Shamong	.....	.....	.....	4	4	.....	8	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	2	1	.....	.....	.....	1
Southampton	2	3	.....	6	7	2	20	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	1	1	.....	2	1	2	.....	3	3	1	1	.....	1
Springfield	2	5	.....	6	7	.....	20	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	3	2	3	1	1	1	3	.....	.....	.....	.....	.....
Washington	.....	1	2	1	.....	.....	4	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westampton	.....	1	.....	.....	4	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2	1	.....	.....	.....	1
Willingboro	1	1	1	4	3	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	3	.....	.....	.....	.....	1	.....	.....	.....	1
Woodland	1	.....	.....	2	3	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	2	.....	1	1	.....	.....	.....	.....
Totals	210	129	146	267	374	8	1,134	58,916	19.25	4	31	.....	24	6	5	140	2	110	56	61	155	57	97	53	98	60	22	3	2	53

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

CAMDEN COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																					
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Camden City	396	262	171	408	296	1	1,534	60,473	25.37	1	38	......	27	4	7	150	2	220	61	72	214	136	111	48	108	59	32	5	6	56
Centre	7	7	4	12	14	......	44	......	......	......	2	......	......	......	1	1	......	4	2	4	10	3	2	4	6	2	......	......	......	2
Delaware	5	3	......	8	5	......	21	......	......	......	......	......	......	......	......	......	......	2	1	2	1	......	3	2	3	1	......	......	......	1
Gloucester City	33	17	17	58	33	1	159	6,802	23.38	3	1	......	1	......	......	6	1	19	12	9	27	8	7	7	10	6	3	......	1	21
Gloucester	11	5	12	42	44	4	118	......	......	1	......	......	......	......	2	5	2	4	13	6	18	7	13	1	17	11	4	......	1	3
Haddon	12	8	6	19	24	......	69	......	......	2	......	......	1	......	......	4	......	9	3	5	12	1	2	3	10	6	1	......	1	2
Stockson	39	12	15	38	26	3	133	......	......	1	1	......	1	1	......	7	1	20	6	9	22	5	15	5	8	6	1	......	2	5
Waterford	11	7	8	10	18	......	54	......	......	1	1	......	1	......	......	4	......	9	3	1	11	5	6	2	4	2	1	......	......	1
Winslow	11	5	3	9	10	1	39	......	......	1	......	......	......	......	......	1	......	8	3	......	8	5	2	2	3	1	......	......	1	1
Totals	525	326	236	604	470	10	2,171	92,082	23.57	10	43	......	31	5	10	178	6	295	104	108	323	170	161	74	169	94	42	5	12	92

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

CAPE MAY COUNTY.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																					
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Cape May City	13	2	5	14	12	......	46	......	......	......	......	......	2	......	2	1	......	4	1	3	6	1	6	2	2	3	3	......	......	1
Dennis	11	3	......	10	11	......	35	......	......	......	......	......	1	......	......	......	......	5	2	3	5	2	3	2	6	1	......	......	......	......
Lower	6	3	2	10	10	1	32	......	......	......	......	......	1	......	......	......	......	4	3	1	3	......	3	......	1	7	......	......	......	4
Middle	9	1	2	11	25	1	49	......	......	......	1	......	......	......	......	......	......	7	1	6	13	2	4	......	5	2	3	......	......	1
Upper	4	2	3	8	22	2	41	......	......	......	......	......	......	......	......	2	1	2	1	......	2	3	6	1	8	7	3	......	......	......
Totals	43	11	12	53	80	4	203	11,476	17.69	......	1	......	4	......	2	3	1	22	8	13	29	8	22	5	22	20	9	......	......	6

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

CUMBERLAND COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																					
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bridgeton	42	14	22	63	56	1	198	11,966	16.55	......	9	......	7	......	......	10	......	16	13	16	26	12	13	12	18	8	6	......	2	7
Commercial	2	2	4	11	7	1	27	....	....	......	2	......	1	......	......	1	......	......	2	4	2	1	4	1	2	1	1	1	1	1
Deerfield	6	2	2	12	7	......	29	....	....	......	......	......	......	......	......	......	......	4	......	4	5	4	1	2	5	1	......	......	......	1
Downe	3	3	4	4	5	1	20	....	....	......	......	......	1	......	......	2	......	4	2	3	2	......	1	......	......	3	......	......	......	......
Fairfield	2	3	5	6	6	......	22	....	....	......	......	......	......	......	......	2	......	2	1	2	4	......	1	4	2	......	1	......	......	......
Greenwich	4	......	1	5	7	......	17	....	....	......	1	......	......	......	......	......	......	2	......	1	4	......	3	1	......	2	2	......	......	1
Hopewell	2	2	1	4	17	1	27	....	....	......	......	......	2	......	......	......	......	1	3	2	2	1	4	1	4	1	......	......	......	1
Landis	33	5	24	46	52	......	160	....	....	......	3	......	4	5	......	2	1	13	10	6	20	9	14	3	27	5	8	1	......	5
Lawrence	2	1	3	5	10	1	22	....	....	......	......	......	......	......	......	1	......	1	3	1	2	......	3	2	1	2	1	......	......	2
Maurice River	9	2	......	9	12	......	32	....	....	......	2	......	1	......	......	......	......	4	1	4	5	2	3	......	4	1	2	......	......	1
Millville	48	14	18	46	47	1	174	10,472	16.62	......	4	......	2	......	......	3	......	30	11	19	20	9	23	8	6	8	3	1	1	7
Stow Creek	......	......	......	2	5	......	7	....	....	......	1	......	......	......	......	......	......	......	......	......	1	......	......	......	1	2	......	......	......	......
Totals	153	48	84	213	231	6	735	46,820	15.70	......	22	......	18	5	......	21	1	77	46	62	93	38	69	34	70	34	24	3	4	26

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

ESSEX COUNTY.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																			
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Belleville	19	16	9	26	21	......	91	......	......	2	......	......	3	......	......	6	......	8	4	4	15	12	5	2	10	8	......	......	......	6
Bloomfield	25	12	10	30	36	1	114	......	......	......	......	......	9	......	1	2	......	14	7	8	17	8	8	2	11	3	5	......	......	3
Caldwell	5	3	2	15	26	1	52	......	......	......	3	......	......	......	......	3	......	3	1	6	7	......	6	8	6	2	1	......	1	1
Clinton	21	4	13	13	20	......	71	......	......	3	......	......	4	......	......	3	......	15	3	4	8	3	9	1	5	4	1	......	......	......
East Orange	49	16	17	67	60	1	210	......	......	......	3	......	4	1	1	13	......	21	13	18	39	6	11	10	13	14	6	1	7	2
Franklin	4	3	......	2	1	......	10	......	......	......	......	......	......	......	2	1	......	4	1	......	......	......	......	......	1	......	......	......	......	1
Livingston	3	......	1	2	9	......	15	......	......	......	......	......	......	......	......	1	......	......	1	2	1	2	2	......	3	1	1	......	......	......
Millburn	13	7	6	7	10	......	43	......	......	1	......	......	3	......	......	3	......	5	1	4	7	4	3	......	1	......	......	......	1	2
Montclair	40	7	11	34	37	1	130	......	......	1	2	......	2	......	......	5	......	17	7	10	20	6	15	7	13	4	3	......	1	2
Newark	1520	975	507	1722	905	12	5,641	193,366	29.17	39	153	14	302	88	20	219	18	759	363	261	876	424	318	252	349	233	117	15	42	205
Orange	113	68	58	153	80	1	473	20,288	23.31	1	6	......	17	4	3	39	3	55	36	30	90	43	22	19	27	16	4	1	4	17
South Orange	22	13	8	22	20	......	85	......	......	......	1	......	1	1	......	4	......	17	7	5	14	5	6	4	4	3	......	......	1	4
West Orange	18	11	9	26	27	......	91	......	......	1	3	......	3	......	......	10	......	5	3	2	21	8	4	8	9	2	3	......	......	5
Totals	1852	1135	651	2119	1252	17	7,026	273,030	25.71	48	171	14	348	94	27	309	21	923	447	354	1115	521	409	313	452	290	141	17	57	248

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

GLOUCESTER COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Clayton	8	1	3	7	8	1	28	......	......	......	2	......	1	......	......	......	......	4	2	1	4	......	......	......	4	2	......	......	1	1
Deptford	8	3	3	13	8	......	35	......	......	......	2	......	......	......	......	1	......	7	1	3	4	......	4	......	2	2	3	......	......	2
East Greenwich	4	2	1	7	11	......	25	......	......	......	......	......	......	......	......	3	......	1	2	......	1	2	3	......	7	2	......	1	......	......
Elk	......	......	......	3	5	......	8	......	......	......	1	......	......	......	......	......	......	......	1	......	1	......	......	......	......	2	1	1	......	1
Franklin	6	3	2	12	6	1	30	......	......	......	......	......	......	......	......	1	......	3	3	2	6	......	4	......	2	3	......	......	......	......
Glassboro	8	5	5	13	13	......	44	......	......	......	3	......	......	......	......	1	......	7	......	2	9	3	1	1	3	7	......	......	......	4
Greenwich	7	3	3	11	12	......	36	......	......	1	......	......	......	......	......	2	1	3	1	1	5	......	5	......	7	2	......	......	......	2
Harrison	2	1	......	6	14	......	23	......	......	......	1	......	......	......	......	......	......	2	2	5	3	1	3	......	3	2	1	......	......	......
Logan	4	......	1	5	7	1	18	......	......	......	1	......	......	......	......	1	......	2	1	1	4	1	......	......	2	......	......	......	......	3
Mantua	4	3	2	8	9	......	26	......	......	......	......	......	4	......	......	......	......	2	2	2	1	1	......	3	3	4	......	1	......	......
Monroe	17	4	4	10	12	......	47	......	......	......	......	......	......	......	......	4	......	13	2	3	3	2	5	4	4	......	1	1	......	1
South Harrison	......	1	1	1	3	......	6	......	......	......	......	......	......	......	......	......	......	1	......	1	......	1	1	1	1	......	......	......	......	......
Washington	3	1	1	4	6	......	15	......	......	......	......	......	1	......	......	......	......	2	2	2	1	......	3	1	......	......	......	......	......	......
West Deptford	8	......	2	8	12	......	30	......	......	1	1	......	......	......	......	3	......	4	......	......	8	......	1	......	6	......	1	......	......	1
Woodbury	19	11	13	20	19	1	83	......	......	1	1	......	3	......	......	5	......	15	7	5	13	1	5	5	5	3	......	1	1	5
Woolwich	8	3	5	12	15	......	43	......	......	1	......	......	1	......	......	1	1	5	3	2	7	3	6	2	4	2	1	......	......	1
Totals	106	41	46	140	160	4	497	29,067	17.10	4	12	......	10	......	......	22	2	71	29	30	70	15	41	17	53	31	8	5	2	21

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

HUDSON COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bayonne	161	59	32	143	57	......	452	21,413	21.11	4	13	......	2	1	......	16	2	77	17	26	80	42	19	18	20	16	8	2	8	25
Guttenberg	21	7	10	24	10	......	72	....	....	2	......	......	4	1	......	5	......	12	6	4	12	2	2	3	4	4	1	......	......	4
Harrison	61	37	32	91	30	2	253	8,950	28.27	7	4	......	20	......	......	8	3	33	24	11	33	24	5	8	13	13	4	1	4	12
Hoboken	321	213	104	428	171	4	1,241	46,018	26.97	3	15	......	40	7	6	70	8	190	93	73	160	102	89	65	48	64	22	2	7	68
Jersey City	1243	771	447	1623	540	9	4,633	166,799	27.78	31	123	1	185	25	24	261	12	573	260	228	812	418	230	203	257	216	92	13	54	199
Kearny	46	23	12	71	34	1	187	....	....	1	2	......	5	1	......	5	......	20	18	12	24	21	18	11	15	6	1	1	3	11
North Bergen	57	30	19	78	59	......	243	....	....	2	3	......	2	......	1	12	1	35	23	10	35	11	23	14	23	16	3	......	......	12
Town of Union	82	43	22	52	41	......	240	11,541	20.80	1	2	......	7	1	......	12	1	36	10	8	43	32	15	4	11	11	5	1	......	5
Union	24	9	4	8	10	......	55	....	....	......	......	......	1	1	......	4	1	8	2	......	14	8	......	1	4	......	......	......	......	1
Weehawken	20	14	8	24	6	1	73	....	....	1	......	......	4	......	1	9	......	9	4	2	8	3	2	3	2	4	1	......	1	11
West Hoboken	97	49	15	62	41	......	264	....	....	2	1	......	10	1	2	13	1	54	9	14	40	29	11	8	14	8	1	......	3	7
Totals	2133	1255	705	2604	999	17	7,713	280,038	26.69	54	163	1	280	38	34	415	29	1047	466	388	1261	692	414	338	411	358	138	20	80	355

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

HUNTERDON COUNTY. Statistical Divisions.	DEATHS AT ALL AGES. Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH. Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Alexandria	3	1	2	5	3	......	14	......	......	......	......	......	......	......	......	2	......	1	2	......	2	......	3	......	1	......	......	......	......	1
Bethlehem	7	1	3	15	14	1	41	......	......	......	......	......	......	1	4	......	......	2	3	3	5	......	6	1	3	2	3	......	......	5
Clinton	4	5	12	14	19	......	54	......	......	......	2	......	1	......	1	11	1	4	5	2	5	1	3	1	5	2	4	......	......	3
Delaware	3	3	7	13	17	......	43	......	......	......	......	......	3	......	......	1	......	1	1	3	7	2	5	2	3	2	2	1	......	5
East Amwell	1	1	2	4	11	......	19	......	......	......	......	......	1	......	......	1	......	1	......	2	6	1	......	2	2	......	1	......	......	1
Franklin	1	1	1	4	10	......	17	......	......	......	......	......	......	......	......	1	......	......	......	2	2	1	3	......	......	......	2	......	......	1
Frenchtown	......	1	2	6	11	......	20	......	......	......	......	......	......	......	......	......	......	......	1	3	3	1	3	......	6	2	......	......	......	1
High Bridge	4	1	3	6	11	......	25	......	......	......	1	......	2	......	......	......	......	1	2	......	7	1	3	......	4	1	......	1	1	1
Holland	......	......	3	13	14	......	30	......	......	......	2	......	......	1	......	1	......	......	1	1	4	1	2	1	7	4	......	......	1	1
Kingwood	4	......	......	5	9	......	18	......	......	1	......	......	......	......	......	......	......	1	......	......	5	......	2	......	4	1	1	1	......	......
Lambertville	19	8	7	29	45	......	108	......	......	......	......	......	2	......	......	3	......	4	7	9	26	5	5	3	14	3	4	......	1	9
Lebanon	5	6	1	6	8	......	26	......	......	......	......	......	......	......	1	1	......	2	2	1	5	4	5	......	1	2	1	......	......	......
Raritan	7	7	12	25	37	......	88	......	......	......	......	......	1	......	......	11	......	4	2	6	13	5	7	5	15	8	2	......	......	2
Readington	3	2	3	12	21	......	41	......	......	1	......	......	2	......	......	......	......	1	1	3	14	......	1	4	6	1	1	1	......	2
Tewksbury	2	5	2	4	7	1	21	......	......	......	......	......	......	......	......	2	......	......	1	......	4	1	2	2	3	2	1	......	......	1
Union	1	1	2	2	9	......	15	......	......	......	......	......	......	......	......	......	......	1	1	......	5	1	2	......	1	3	......	......	......	1
West Amwell	3	......	2	3	3	......	11	......	......	......	......	......	......	......	......	......	......	......	......	......	1	......	1	3	2	1	......	......	1	......
Totals	67	43	64	166	249	2	591	35,855	16.17	2	5	......	12	2	6	34	1	23	29	35	114	24	58	24	77	34	22	4	4	34

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

MERCER COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
East Windsor	12	4	5	14	24	2	61	......	......	1	1	......	2	......	......	3	......	6	1	7	10	4	6	4	5	2	3	......	......	2
Ewing	5	4	7	35	46	1	98	......	......	......	6	......	......	......	......	3	......	5	6	5	10	3	5	6	33	4	1	......	......	3
Hamilton	5	9	18	65	50	......	147	......	......	1	7	1	1	2	......	10	1	5	16	10	24	1	9	8	17	6	6	......	2	13
Hopewell	4	1	2	12	19	2	40	......	......	1	1	......	......	......	......	2	1	1	......	......	5	3	6	1	6	2	1	1	......	5
Lawrence	4	2	1	13	9	2	31	......	......	......	1	......	......	......	......	......	......	4	1	1	11	......	2	1	3	1	2	......	......	2
Princeton	11	7	7	21	31	......	77	......	......	1	2	......	......	......	......	5	......	10	5	4	14	2	8	12	8	5	......	1	......	1
Trenton	331	198	166	359	243	20	1,317	66,686	19.17	11	15	12	28	2	16	135	3	164	77	61	186	79	70	45	97	62	28	6	14	54
Washington	3	2	1	6	3	1	16	......	......	......	2	......	2	......	......	......	......	......	......	2	1	1	3	1	......	......	......	......	1	......
West Windsor	3	......	1	11	10	......	25	......	......	......	2	......	......	......	......	......	......	1	1	8	6	1	5	1	......	2	......	......	......	2
Totals	378	227	208	536	435	28	1,812	85,254	21.25	15	37	13	31	4	16	158	5	196	107	98	267	94	109	79	169	84	36	8	17	82

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

MIDDLESEX COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Cranbury	10	3	1	8	12	4	38	......	......	......	......	......	1	......	......	1	......	8	1	3	6	5	4	3	4	2	1	......	1	1
East Brunswick	9	12	10	17	21	1	70	......	......	1	1	......	4	......	......	7	......	3	4	5	11	4	5	2	4	5	2	......	......	6
Madison	1	1	3	9	10	......	24	......	......	1	......	......	4	......	......	......	......	1	1	2	1	......	1	......	3	4	2	......	......	3
Monroe	8	3	6	16	20	1	54	......	......	......	1	......	2	......	......	1	1	7	4	2	6	3	6	......	12	3	3	......	1	......
New Brunswick	83	80	71	120	99	8	461	18,741	24.60	2	9	......	52	......	......	29	1	40	19	25	82	35	24	25	28	22	12	2	1	15
North Brunswick	9	......	1	5	3	......	18	......	......	......	......	......	......	......	......	......	......	3	1	......	3	2	......	......	2	1	......	......	......	3
Perth Amboy	108	40	13	60	21	2	244	10,792	22.61	......	1	......	3	......	......	12	......	55	12	3	30	17	10	13	11	10	1	......	5	14
Piscataway	6	5	4	26	20	2	63	......	......	......	......	......	3	......	......	2	......	5	5	5	5	2	9	3	10	2	1	......	2	7
Raritan	13	7	7	18	26	......	71	......	......	......	2	......	5	......	1	......	......	3	5	3	7	4	9	1	7	7	3	......	......	6
Sayreville	4	3	2	3	2	......	14	......	......	......	......	......	......	......	......	2	......	1	......	1	2	......	......	......	......	......	......	......	......	6
South Amboy	24	16	7	32	22	1	102	......	......	4	3	......	......	......	......	8	......	7	8	4	21	5	7	3	2	9	1	......	1	4
South Brunswick	3	2	4	13	17	2	41	......	......	......	1	......	1	1	......	......	......	2	4	2	4	2	2	4	4	4	2	2	2	2
Woodbridge	18	6	5	35	20	......	84	......	......	1	......	......	......	......	......	1	......	5	6	3	17	7	5	6	7	8	1	......	1	9
Totals	296	178	134	362	293	21	1,284	63,982	20.07	10	18	......	75	1	1	63	2	140	70	58	195	86	75	60	90	77	29	4	14	76

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

MONMOUTH COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic	2	3	4	11	12		32			1						6		3	3		6		3	1	3	2	1			3
Eatontown	9	2	3	10	11	1	36						1	1		1		6	1	2	7	1	3	1	4				2	4
Freehold	12	4	3	35	33		87				1		2					5	5	9	17	3	8	8	9	6	3		2	3
Holmdel	3	1	2	6	9		21				1					2	1		5		2		2		2	1	1			1
Howell	5	5	2	16	23		51									1		2	2	3	14	2	4	2	3	6			1	5
Long Branch	24	8	9	38	20	1	100	8,067	12.40	1	3		1			2		18	6	7	10	4	9	4	7	4	7			4
Manalapan	6		1	10	14		31										1	2			5	2	9	5	2	1			1	
Marlboro	6	1	7	5	15		34				2					2		1		4	7	3	3		4	1		1		2
Matawan	7	1	8	20	21		57			2	2					3		3	5	4	11	1	7	3	4	5			1	2
Middletown	27	10	16	30	34	1	118			1	1					11	1	9	4	4	20	2	11	14	7	7	1			7
Millstone	3	6	10	4	8		31						3			2		6		3	9	2	1	3		2				
Neptune	48	14	18	57	52		189			2	2				1	6	1	32	6	17	20	9	18	5	14	17	3	1		3
Ocean	1	1	1	4	5		12									1					3		1	1			1			4
Raritan	17	7	6	33	27		90			1						6		8	9	8	16	6	4	8	10	7				
Shrewsbury	57	7	6	38	53		161								1	4		42	5	6	24	5	6	8	18	7	2	1	1	7
Upper Freehold	5	8	5	11	22	1	52			1	1		1			2		2	4	3	9	2	8	3	6	3	1			2
Wall	18	13	3	16	26	3	79				2				1	3		14		3	19	5	5	1	9	6	1		1	2
Totals	250	91	104	344	385	7	1,181	71,848	16.44	9	15		8	1	3	52	4	153	55	78	207	47	102	67	102	75	21	8	9	49

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

MORRIS COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Boonton	4	3	3	9	12		31						1			1			5	1	9	1	1	4	1	2	1			1
Chatham	14	7	19	15	28	1	84							1		17		7	4	2	3	7	7	6	8	3	3		1	2
Chester	4		3	7	9	1	24			1	2					1		2	2	2	2		2	4	1	1	1			
Hanover	10	6	3	72	57	4	152				2		1			1	1	3	4	9	12	1	8	6	85	5			1	5
Jefferson	6	2	3	8	8		27								2			2		2	7	2	2		3		2			2
Mendham	1	4	1	7	11		24								1	2			2	1	6	1	4	2	1	1				1
Montville	5	2	1	5	7	1	21						1					4	2		2	1		3	1	1	3			2
Morristown	37	21	17	59	47		181	8,702	20.80	1	3		8	3	2	5		19	11	17	27	13	8	5	9	15	5	2	1	7
Mount Olive	7	3	2	5	9		26						1		1	1		3	1	1	6	2	2		3	2		1		
Passaic	6	3	3	7	14		33									3		4	1	1	7	1	7	2	2	2	1			
Pequannock	3	4	2	11	10		30			1			1		2			1	4	2	6	1	5	1	2		1			1
Randolph	35	21	15	38	30	1	140			3	3		4	2		3		16	5	9	22	7	12	6	14	5	2		2	3
Rockaway	16	14	9	22	22	3	86			1	1		4			11		6	3	1	13	4	5	6	4	2	1		1	8
Roxbury	9	7	7	21	19	2	65			1	1				2	6		6		2	10	2	6	2		5	3		1	12
Washington	3	4	4	9	13		33									1		4	4		8	4	2	4	5	3	1			1
Totals	160	101	92	295	296	13	957	55,421	17.27	8	12		21	6	10	52	1	77	48	50	140	47	71	51	139	47	24	3	7	45

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

OCEAN COUNTY. Statistical Divisions.	DEATHS AT ALL AGES. Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH. Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Berkeley	6	......	2	6	8	......	22	....	....	......	......	......	......	......	......	......	......	3	3	2	3	1	......	1	4	1	......	......	......	2
Brick	10	4	6	28	30	......	78	....	....	......	......	......	1	......	......	1	1	5	3	8	13	2	12	8	9	3	2	......	2	2
Dover	7	1	1	18	15	......	42	....	....	......	......	......	......	......	......	......	......	3	5	5	5	1	3	3	3	3	2	1	......	2
Eagleswood	......	2	......	......	5	......	7	....	....	......	......	......	1	......	......	......	......	......	......	......	1	......	......	......	......	2	......	......	......	
Jackson	5	5	3	5	21	1	40	....	....	......	1	......	......	......	......	......	......	5	3	1	5	3	3	3	5	1	2	......	......	......
Lacey	6	1	2	3	6	......	18	....	....	......	1	......	......	......	......	......	......	3	1	3	1	1	2	......	1	1	1	......	......	......
Little Egg Harbor	9	......	2	9	17	1	38	....	....	......	1	......	......	......	......	2	......	2	1	5	8	1	1	1	3	5	......	......	......	1
Manchester	3	......	1	3	4	......	11	....	....	......	......	......	1	......	......	......	......	1	1	......	2	......	1	......	1	1	......	......	1	......
Ocean	2	......	1	6	7	......	16	....	....	......	......	......	......	......	......	......	......	2	2	2	1	1	3	......	1	3	1	......	......	......
Plumstead	9	10	9	7	13	......	48	....	....	......	......	......	2	......	......	15	......	3	4	1	6	2	3	1	3	1	......	1	......	1
Stafford	3	1	1	4	4	......	13	....	....	......	......	......	1	......	......	......	......	3	......	......	1	......	......	......	......	2	1	......	......	1
Union	2	1	1	1	5	......	10	....	....	......	......	......	1	......	......	......	......	2	......	2	......	......	1	......	1	1	......	......	......	1
Totals	62	25	29	90	135	2	343	16,198	21.18	......	3	......	7	......	......	18	1	32	23	29	46	12	29	17	31	24	9	2	3	10

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

PASSAIC COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year."	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.;	Consumption—male.	Consumption...female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Acquackanonk	10	2	8	13	7	1	41	......	......	......	......	4	......	......	......	2	......	3	......	......	5	2	2	5	2	2	2	1	1	5
Little Falls	9	2	2	8	5	......	26	......	......	......	......	......	......	......	1	......	......	1	......	1	8	1	1	......	2	......	1	......	......	5
Manchester	9	6	4	12	10	......	41	......	......	......	......	......	1	......	......	3	......	5	1	2	5	4	1	4	4	2	4	......	1	2
Passaic	120	48	22	103	37	2	332	14,908	22.27	2	10	5	......	......	3	23	......	63	11	18	46	16	16	11	16	22	4	......	3	11
Paterson	542	258	179	573	355	1	1,908	84,371	22.61	7	15	1	17	7	16	142	5	259	111	104	328	157	113	69	109	100	37	3	14	78
Pompton	14	6	3	7	11	......	41	......	......	......	......	......	......	......	1	4	......	6	......	......	8	2	1	1	5	3	......	......	......	4
Wayne	2	......	......	5	18	1	26	......	......	......	......	......	......	......	......	......	......	......	2	2	5	1	2	1	4	3	......	......	1	2
West Milford	9	7	2	7	11	......	36	......	......	......	......	......	5	......	1	2	......	5	......	3	5	1	3	......	5	3	1	......	......	......
Totals	715	329	220	728	454	5	2,451	113,814	21.54	9	25	10	23	7	22	176	5	342	125	130	410	184	139	91	147	135	49	4	20	107

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

SALEM COUNTY.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Alloway	3	......	2	5	8	......	18	......	......	......	1	......	1	......	......	......	......	1	1	1	2	......	3	1	3	1	1	......	......	......
Elsinboro	1	......	......	......	......	......	1	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Lower Alloways Creek	......	......	......	1	9	......	10	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	4	......	2	......	......	1	......	2
Lower Penns Neck	4	......	......	6	5	......	15	......	......	......	......	......	......	......	......	......	......	2	1	......	1	2	1	2	4	1	......	......	......	1
Mannington	6	1	5	13	11	......	36	......	......	......	......	......	......	......	......	......	......	6	1	4	6	......	3	4	4	3	1	......	1	......
Oldmans	4	2	3	6	5	......	20	......	......	......	......	......	1	......	......	1	......	2	2	......	4	1	1	......	3	......	2	......	......	......
Pilesgrove	14	2	5	13	19	......	53	......	......	......	2	......	1	......	......	1	1	10	1	5	11	......	4	2	8	3	......	......	......	......
Pittsgrove	6	1	2	3	13	......	25	......	......	1	......	......	1	......	......	......	......	5	1	1	4	2	3	......	3	2	1	......	......	......
Quinton	8	1	2	2	9	1	23	......	......	......	......	......	1	......	......	......	......	2	......	1	3	4	1	1	2	1	......	......	......	1
Salem	24	11	5	29	38	1	108	5,516	19.58	......	1	......	5	......	......	1	......	8	9	6	20	5	11	4	11	8	3	1	......	5
Upper Penns Neck	16	3	5	6	9	......	39	......	......	......	......	......	......	......	......	6	1	10	2	......	6	2	3	1	3	2	1	......	1	1
Upper Pittsgrove	4	1	2	6	2	......	15	......	......	......	1	......	......	......	......	......	......	2	2	2	1	......	3	......	......	......	......	......	......	......
Totals	90	22	31	90	128	2	363	25,151	14.43	1	5	......	10	......	......	9	2	48	20	20	58	16	37	15	43	21	9	2	2	10

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

SOMERSET COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bedminster	8	6	4	4	11	......	33	......	......	3	......	......	1	3	......	2	......	2	......	2	4	4	4	1	1	3	......	......	......	......
Bernards	4	2	1	7	14	......	28	......	......	......	......	......	......	2	......	......	......	3	1	......	6	......	3	2	3	3	1	......	......	1
Branchburg	4	2	2	2	5	......	15	......	......	......	......	......	......	......	......	1	......	3	......	......	3	......	1	......	2	......	......	......	2	1
Bridgewater	51	20	15	51	55	......	192	......	......	2	6	......	3	4	......	9	......	26	11	9	30	6	20	8	14	7	6	2	2	6
Franklin	7	7	6	19	25	1	65	......	......	......	......	......	6	1	......	2	......	5	5	5	11	4	4	8	3	3	1	......	......	3
Hillsborough	5	5	1	14	22	......	47	......	......	......	2	......	......	......	2	......	......	4	1	3	9	1	1	5	4	6	1	......	1	2
Montgomery	3	2	1	7	13	1	27	......	......	......	......	......	......	......	......	1	......	1	1	......	10	......	1	2	4	3	......	......	1	......
North Plainfield	10	1	4	11	21	......	47	......	......	......	......	......	......	......	......	......	......	5	3	4	8	3	5	1	5	3	5	......	......	2
Warren	1	2	1	7	7	......	18	......	......	......	......	......	......	......	......	......	......	1	1	2	1	......	3	2	......	2	2	......	......	2
Totals	93	47	35	122	173	2	472	28,665	16.47	5	8	......	10	10	2	15	......	50	23	25	82	18	42	29	36	30	16	2	6	17

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

SUSSEX COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.							Estimated population, 1892.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.			Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Andover	4	1	......	3	2	1	11	......	......	......	......	......	......	......	3	......	......	......	2	......	1	1	1	......	1	2	......	......	......	......
Byram	4	3	2	6	11	1	27	......	......	......	......	......	......	......	1	......	......	2	......	2	10	1	2	......	6	2	......	......	......	......
Frankford	5	1	4	9	14	1	34	......	......	......	2	......	......	......	3	......	......	......	1	......	9	1	3	1	3	2	2	1	......	......
Green	1	1	2	1	5	......	10	......	......	......	......	......	......	......	......	1	......	1	......	1	1	......	......	......	1	1	2	......	......	......
Hampton	......	......	1	3	6	......	10	......	......	......	......	......	......	......	......	......	......	......	......	......	2	......	3	1	1	......	......	......	1	1
Hardyston	11	3	1	6	10	......	31	......	......	......	......	......	......	......	......	......	......	7	......	1	8	1	2	......	4	1	1	......	......	1
Lafayette	......	1	......	3	5	1	10	......	......	......	......	......	......	......	......	......	......	1	1	1	......	......	......	2	2	2	......	......	......	1
Montague	1	1	......	5	4	......	11	......	......	......	1	......	......	......	......	......	......	2	......	1	2	......	2	......	2	......	1	......	......	......
Newton	8	3	3	13	11	......	38	......	......	......	......	......	......	......	1	2	......	2	......	5	6	1	3	2	4	1	2	......	1	1
Sandyston	1	......	3	4	......	......	8	......	......	......	1	......	......	......	......	1	......	......	......	1	1	1	......	......	1	......	1	......	......	1
Sparta	2	1	......	3	5	1	12	......	......	......	......	......	......	......	1	......	......	1	1	2	4	......	......	......	1	......	......	......	......	1
Stillwater	4	2	3	4	12	......	25	......	......	......	......	......	......	......	1	......	......	1	1	2	9	1	4	......	......	1	......	......	......	3
Vernon	9	1	......	5	10	......	25	......	......	......	......	......	......	......	2	2	1	......	......	2	7	1	1	......	2	2	......	......	......	......
Walpack	......	......	1	3	3	......	7	......	......	......	......	......	......	......	......	......	......	......	......	......	1	......	3	2	......	......	......	......	1	......
Wantage	8	1	4	15	32	1	61	......	......	......	2	......	1	......	......	......	......	2	5	5	15	3	2	......	11	5	3	......	2	1
Totals	58	19	24	83	130	6	320	22,250	14.38	......	6	......	1	......	12	6	1	19	11	23	76	11	26	8	39	19	12	1	5	10

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

UNION COUNTY. Statistical Divisions.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Clark	......	......	2	2	......	......	4	....	....	......	......	......	......	......	......	......	......	......	1	1	1	......	......	......	1	......	......	......	......	......
Cranford	3	......	4	5	11	......	23	....	....	......	2	......	......	......	......	......	1	2	1	3	4	......	3	1	5	......	......	......	......	......
Elizabeth	238	137	54	270	149	......	848	40,022	21.19	5	11	......	38	11	......	18	6	118	33	36	154	74	51	41	53	41	14	1	11	45
Fanwood	2	1	......	8	10	......	16	....	....	......	......	......	......	......	......	......	......	3	......	......	1	......	4	1	4	1	......	......	......	2
Linden	7	2	1	14	13	1	38	....	....	......	1	......	1	1	......	......	......	3	2	3	6	......	1	......	2	5	1	......	1	3
New Providence	3	2	3	......	6	1	15	....	....	......	......	......	......	......	......	1	......	1	1	1	5	......	2	......	1	......	1	1	......	......
Plainfield	46	12	18	73	63	1	208	12,207	17.04	2	3	......	3	2	......	5	1	23	13	9	30	7	29	10	27	9	5	1	2	11
Rahway	25	17	12	55	57	......	166	7,201	23.05	......	4	......	5	1	......	2	......	15	10	14	31	8	10	6	19	18	3	......	1	10
Springfield	......	5	5	5	5	......	20	....	....	......	......	......	......	......	......	4	......	1	3	1	2	1	4	......	......	2	......	......	......	....
Summit	14	4	9	16	6	1	50	....	....	......	......	......	......	.....	......	7	......	9	9	......	6	4	2	3	1	1	1	......	......	4
Union	5	1	......	9	17	......	32	....	....	......	1	......	......	......	......	1	......	1	......	......	3	......	7	2	6	3	2	......	......	......
Westfield	8	6	2	15	18	......	49	....	....	......	3	......	......	......	5	1	......	5	1	2	8	1	2	2	6	5	2	......	......	1
Totals	351	187	105	467	355	4	1,469	76,717	19.16	7	25	......	47	15	5	39	8	181	74	70	251	95	115	66	125	85	29	3	15	76

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year Ending June 30th, 1892.

WARREN COUNTY.	DEATHS AT ALL AGES.									PRINCIPAL CAUSES OF DEATH.																				
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Undefined.	Total, including unclassified.	Estimated population, 1892.	Death-rate per 1,000.	Remittent fever, &c.	Enteric or typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Diphtheria and croup.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Renal and cystic diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Allamuchy	3			2	3		8												1		1	2						1		
Belvidere	4	4	3	13	12		36				1							1	2	2	7	1	1	7	5	2	3			3
Blairstown	1	2	3	6	12		24											2		3	9	2	1		3	1				1
Franklin	3	1	6	4	13	1	28				1		1			5		1	2		5		3	2	4	1	1			
Frelinghuysen	2			3	11		16											1	1	1	2	1	2	1	2	2				2
Greenwich	6		1	6	9		22				1					2		2	3		2	2	2		3	2				1
Hackettstown	10	6	6	15	14	1	52				1				2			8	3	2	8	3	5	2	4	2	1		1	3
Hardwick			2	1	1		4												1	1							1		1	
Harmony	2	2	4	5	5		18						4							1	4		2		1				1	2
Hope	5	3		5	7	1	21								2			4			3	1	2	1	3	1	1			3
Independence	1	1		3	3		8													1	3		1	1	1					
Knowlton	5	1		10	13		29				1							1	4	1	4	2	3	1	2	1	2			2
Lopatcong	6	2	4	5	10		27			1						3		5	2	2	6			1	2		1		1	
Mansfield	2	3		6	15		26											1	1		7	1	6	1	5	2				
Oxford	16	2	2	21	25		66											8	1	4	14		10	5	7		1		2	4
Pahaquarry	2			3	1		6														3	1			1					1
Phillipsburg	39	15	12	39	26		131	8,887	14.77		3		3		1	8		20	4	5	28	10	12	8	9	5	3		1	5
Pohatcong	2	4	4	3	6	2	21			1			2							1	4	2	2	1	3				1	1
Washington	12	4	8	14	17		55			1					1	5		6	3	5	4	1	9	2	6	4			1	
Totals	121	50	55	164	203	5	598	[illegible]	[illegible]	3	8		10		6	23		60	28	29	[illegible]	29	61	33	61	23	14	1	9	28

CLIMATOLOGY.

We furnish the usual facts from the Weather Service as to several localities chosen. As we have only to do with weather in its relation to disease, the statistics here presented relate to the temperature, humidity, prevailing winds, rain, snow, range of precipitation and cloudy days. Our choice of localities is governed chiefly by geographical considerations, as fully set forth in the Sixth Report, pages 269–284, in an article on "Comparative Facts in Climatology and Geology." (See also the article on "Climatology" in the Fifth Report.)

Physicians are urged to compare these tables with the incidence of disease.

STATION, BELVIDERE, N. J.

Latitude, 40° 49′ N.; Longitude, 75° 04′ W. Height of Barometer Cistern above Sea Level, 229 feet.

OBSERVER, SAMUEL J. HIXSON, N. J. WEATHER SERVICE.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July				89.0	46.0	67.8		N. W.	4.52		9	[illegible]
August				97.0	50.0	71.0		S.	5.11		10	[illegible]
September				93.0	41.0	67.1		S. E.	2.24		[illegible]	[illegible]
October				83.0	23.0	51.4		S. W.	4.18		5	[illegible]
November				61.0	13.0	38.2		S. W.	1.63		[illegible]	[illegible]
December				59.0	14.0	37.4		S. W.	4.09		6	[illegible]
1892.												
January				60.0	1.0	25.8		N. W.	6.02		7	11
February				49.0	13.0	31.3		N. W.	1.36		6	11
March				58.0	8.0	32.1		N. W.	4.72		6	4
April				82.0	25.0	46.9		N. W.	1.56		7	12
May				84.0	35.0	58.6		E.	4.73		13	5
June				96.0	51.0	71.4		S. W.	4.96		11	[illegible]
For the year.				75.9	26.7	49.9		N. W.	45.12		94	[illegible]

* Including melted snow.

STATION, NEWTON, N. J.

Latitude, 41° 03′ N.; Longitude, 74° 45′ W. Height of Barometer Cistern above Sea Level, —— feet.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July				86.0	52.0	69.0			3.68		13	[illegible]
August				91.0	53.0	71.2			4.48		[illegible]	[illegible]
September				83.0	48.0	66.9			1.57		5	
October				80.0	29.0	50.6			1.88		5	[illegible]
November				63.0	8.0	38.0			2.87		[illegible]	
December				59.0	10.0	37.5			4.30		9	
1892.												
January				60.0	2.0	25.6		N. W.	2.50		6	15
February				48.0	7.0	29.3		N. E.	0.86		4	16
March				58.0	10.0	30.6		N. W.	4.07		6	14
April				82.0	23.0	46.8		N. W.	1.18		8	[illegible]
May				85.0	34.0	58.2		S. W.	4.16		12	[illegible]
June				94.0	47.0	70.8		S. W.	6.12		14	[illegible]
For the year.				74.1	26.6	49.6		N. W.	37.67		[illegible]	[illegible]

* Including melted snow.

STATION, PATERSON, N. J.

Latitude, 40° 55′ N.; Longitude, 74° 11′ W. Height of Barometer Cistern above Sea Level, 84.0 feet.

OBSERVER, JOHN T. PROBERT, N. J. WEATHER SERVICE.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	....	....	....	92.0	51.0	70.4	....	S. W.	3.17	....	10	6
August	....	....	....	98.0	52.0	72.9	....	S. W.	3.38	....	12	8
September	....	....	....	91.0	47.0	69.6	....	W.	2.80	....	4	7
October	....	....	....	88.0	25.0	54.2	....	N. W.	2.14	....	7	11
November	....	....	....	68.0	12.0	41.7	....	N. W.	3.04	....	6	10
December	....	....	....	67.0	15.0	42.0	....	N. W.	5.18	....	9	10
1892.												
January	....	....	....	62.0	7.0	30.6	....	N. W.	5.93	....	8	7
February	....	....	....	55.0	13.0	34.3	....	N. W.	1.12	....	6	14
March	....	....	....	64.0	15.0	36.0	....	N. W.	5.60	....	11	9
April	....	....	....	87.0	26.0	51.4	....	W.	1.87	....	9	9
May	....	....	....	89.0	38.0	61.6	....	S. W.	6.06	....	14	19
June	....	....	....	98.0	50.0	73.6	....	S. W.	3.68	....	13	11
For the year.	....	....	....	79.9	29.2	53.2	....	N. W.	43.47	....	109	121

* Including melted snow.

STATION, NEW YORK CITY.

Latitude, 40° 43′ N.; Longitude, 70° 0′ W. Height of Barometer Cistern above Sea Level, 185 feet.

OBSERVER, E. B. DUNN, U. S. WEATHER BUREAU.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	30.36	29.75	30.02	89.0	58	71.0	75.0	S.	4.11	....	15	10
August	30.24	29.72	30.00	94.0	61	74.0	81.0	S.	5.87	....	17	16
September	30.40	29.87	30.15	87.0	54	70.0	80.0	S.	2.12	....	9	5
October	30.53	29.66	30.07	83.0	34	54.0	75.0	S. W.	2.69	....	10	9
November	30.80	29.30	30.17	64.0	10	44.0	75.0	N. W.	2.06	....	9	12
December	30.59	29.45	30.17	68.0	14	42.0	74.0	S. W.	3.30	....	10	9
1892.												
January	30.66	29.29	30.05	62.0	8	30.0	76.0	S. W.	5.61	....	12	15
February	30.67	29.26	30.14	51.0	12	33.0	74.0	N. E.	1.27	....	9	17
March	30.51	29.30	29.98	56.0	16	35.0	69.0	N. W.	4.62	....	9	10
April	30.52	29.57	30.06	79.0	31	50.0	63.0	N. W.	2.36	....	7	8
May	30.38	29.56	29.98	81.0	42	60.0	73.0	S. E.	4.30	....	16	10
June	30.36	29.65	29.99	91.0	56	72.0	78.0	S. W.	2.96	....	17	7
For the year.	30.50	29.53	30.065	75.4	33	52.9	74.4	S. W.	41.27	....	140	128

* Including melted snow.

STATION, NEWARK, N. J.

Latitude, 40° 29′ N.; Longitude, 74° 27′ W. Height of Barometer Cistern above Sea Level, —— feet.

OBSERVER, F. W. RICORD, N. J. WEATHER SERVICE.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	....	....	....	88.0	57.0	69.9	....	S. E.	6.73	....	13	
August	....	....	....	93.0	56.0	72.4	....	S. W.	4.61	....	17	
September	....	....	....	88.0	51.0	68.9	....	S. W.	2.53	....	5	
October	....	....	....	82.0	30.0	53.4	....	N. W.	2.54	....	[illegible]	
November	....	....	....	64.0	12.0	43.4	....	N. W.	2.44	....	[illegible]	
December	....	....	....	66.0	12.0	41.8	....	S. W.	4.08	....	9	
1892.												
January	....	....	....	60.0	8.0	30.1	....	N. W.	5.63	....	13	
February	....	....	....	50.0	13.0	33.7	....	N. W.	1.62	....	[illegible]	
March	....	....	....	56.0	16.0	34.4	....	N. W.	3.54	....	10	
April	....	....	....	80.0	28.0	48.9	....	N. W.	3.53	....	16	
May	....	....	....	83.0	39.0	58.9	....	S. W.	4.56	....	16	
June	....	....	....	94.0	52.0	71.8	....	S. W.	4.82	....	15	
For the year	....	....	....	75.3	31.2	52.3	....	N. W.	46.63	....	[illegible]	

* Including melted snow.

STATION, NEW BRUNSWICK, N. J.

Latitude, 49° 29′ N.; Longitude, 74° 27′ W. Height of Barometer Cistern above Sea Level, 90 feet.

OBSERVER, MRS. G. H. COOK, N. J. WEATHER SERVICE.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	....	....	....	88.0	52.0	68.8	....	S. E.	3.24	....	13	11
August	....	....	....	95.0	51.0	71.9	....	S. E.	6.55	....	16	[illegible]
September	....	....	....	86.0	45.0	67.4	....	S. E.	1.47	....	6	[illegible]
October	....	....	....	92.0	25.0	54.4	....	N. W.	3.29	....	9	13
November	....	....	....	66.0	12.0	41.8	....	N. W.	2.27	....	[illegible]	10
December	....	....	....	67.0	14.0	40.4	....	S. W.	4.42	....	[illegible]	[illegible]
1892.												
January	....	....	....	62.0	1.0	28.3	....	N. W.	5.42	....	12	[illegible]
February	....	....	....	51.0	13.0	33.0	....	N. W.	1.77	....	[illegible]	14
March	....	....	....	58.0	16.0	34.1	....	N. W.	4.08	....	9	10
April	....	....	....	82.0	26.0	48.2	....	N. W.	2.50	....	9	[illegible]
May	....	....	....	78.0	36.0	58.8	....	S. W.	4.78	....	16	[illegible]
June	....	....	....	90.0	50.0	72.5	....	S. W.	3.21	....	13	[illegible]
For the year	....	....	....	76.2	28.4	51.6	....	N. W.	42.98	....	[illegible]	[illegible]

* Including melted snow.

STATION, BEVERLY, N. J.

Latitude, 44° 4′ N.; Longitude, 74° 55′ W. Height of Barometer Cistern above Sea Level, 40 feet.

OBSERVER, C. F. RICHARDSON, N. J. WEATHER SERVICE.

	BAROMETER. Reduced to 32°			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	....	....	....	90.0	52.0	71.2	83.0	W.	4.89	....	15	11
August	....	....	....	96.0	52.0	73.3	87.0	W.	5.71	....	15	9
September	....	....	....	90.0	46.0	69.6	84.0	S.	2.62	....	6	3
October	....	....	....	88.0	24.0	53.2	80.0	N. W.	2.69	....	10	10
November	....	....	....	67.0	13.0	42.2	78.0	N. W.	2.40	....	9	6
December	....	....	....	69.0	14.0	40.4	77.0	S. W.	4.50	....	9	8
1892.												
January	....	....	....	62.0	4.0	29.6	81.0	N. W.	5.45	....	13	12
February	....	....	....	55.0	13.0	34.0	80.0	N. E.	1.87	....	8	10
March	....	....	....	63.0	15.0	34.9	75.0	N. W.	5.33	....	12	10
April	....	....	....	84.0	27.0	50.4	69.0	N. W.	2.40	....	9	8
May	....	....	....	86.0	37.0	61.4	76.0	N. W.	5.55	....	14	7
June	....	....	....	94.0	48.0	74.2	79.0	S.	4.07	....	11	11
For the year.	....	....	....	78.7	28.8	52.9	79.1	N. W.	47.48	....	131	105

* Including melted snow.

STATION, PHILADELPHIA, PA.

Latitude, 39° 57′ N.; Longitude, 75° 9′ W. Height of Barometer Cistern above Sea Level, 117 feet.

OBSERVER, L. M. DEY, U. S. WEATHER BUREAU.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	30.36	29.77	30.03	89.0	54.0	71.9	71.0	N. W.	4.65	....	13	16
August	30.24	29.71	30.00	97.0	54.0	74.3	77.0	S. W.	4.22	....	14	14
September	30.42	29.88	30.16	91.0	51.0	71.6	77.0	S. W.	1.90	....	7	6
October	30.54	29.68	30.09	86.0	36.0	54.9	70.0	N. W.	2.57	....	9	10
November	30.84	29.38	30.20	66.0	15.0	44.3	72.0	N. W.	1.70	....	9	10
December	30.62	29.55	30.21	66.0	15.0	42.8	69.0	S. W.	3.78	....	11	12
1892.												
January	30.65	29.31	30.08	62.0	11.0	31.4	73.0	N. W.	4.48	....	13	16
February	30.71	29.37	30.16	54.0	14.0	35.2	71.0	N. E.	0.98	....	9	12
March	30.51	29.34	30.08	59.0	19.0	35.8	....	N. W.	4.32	....	15	12
April	30.53	29.64	30.09	80.0	32.0	50.9	61.0	N. W.	2.08	....	12	13
May	30.35	29.60	29.99	84.0	44.0	61.9	71.0	N. W.	5.12	....	14	13
June	30.31	29.71	30.00	92.0	56.0	74.5	73.0	S. W.	1.98	....	10	11
For the year.	30.507	29.578	30.087	77.2	23.4	54.1	65.4	N. W.	37.78	....	136	145

* Including melted snow.

STATION, ATLANTIC CITY, N. J.

Latitude, 39° 22′ N.; Longitude, 74° 25′ W. Height of Barometer Cistern above Sea Level, 53 feet.

OBSERVER, WM. T. BLYTHE, U. S. WEATHER BUREAU.

	BAROMETER, Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (Inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days
	Max.	Min.	Mean.	Max.	Min.	Mean.;						
1891.												
July	30.35	29.76	30.04	78.0	52.0	69.0	85.0	S.	7.05	......	15	[illegible]
August	30.22	29.72	30.01	87.0	56.0	72.0	84.0	S.	2.87	......	12	[illegible]
September	30.42	29.82	30.17	86.0	50.0	69.0	82.0	S. E.	0.90	......	5	[illegible]
October	30.48	29.69	30.09	85.0	30.0	54.5	79.0	N. W.	5.39	......	12	[illegible]
November	30.83	29.42	30.19	60.0	14.0	44.0	80.0	N. W.	2.24	......	10	[illegible]
December	30.61	29.58	30.21	56.0	15.0	42.0	79.0	S. W.	3.19	......	9	[illegible]
1892.												
January	30.62	29.87	30.06	53.0	10.0	33.0	81.0	N. W.	3.02	......	11	[illegible]
February	30.67	29.34	30.14	57.0	10.0	35.0	83.0	N. E.	1.43	......	10	[illegible]
March	30.52	29.32	30.01	55.0	14.0	35.0	81.0	N. W.	3.69	......	14	[illegible]
April	30.49	29.62	30.09	76.0	28.0	46.5	81.0	S. W.	3.05	......	10	[illegible]
May	30.40	29.60	30.00	80.0	40.0	57.0	90.6	S. W.	5.51	......	13	[illegible]
June	30.32	29.72	30.02	89.0	51.0	68.3	84.0	S. W.	4.44	......	[illegible]	[illegible]
For the year.	30.49	29.58	30.086	71.8	30.8	52.1	82.4	S.W. & N.W.	42.78	......	131	[illegible]

* Including melted snow.

STATION, CAPE MAY, N. J.

Latitude, 38° 56′ N.; Longitude, 74° 53′ W. Height of Barometer Cistern above Sea Level, —— feet.

OBSERVER, J. F. LEAMING, M.D., N. J. WEATHER SERVICE.

	BAROMETER, Reduced to 32 .			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (Inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy days
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1891.												
July	....	....	....	83.0	55.0	70.9	....	S.	7.33	....	[illegible]	[illegible]
August	....	....	....	90.0	55.0	73.0	....	W.	4.02	....	15	[illegible]
September	....	....	....	85.0	49.0	69.0	....	S.	1.83	....	4	5
October	....	....	....	82.0	31.0	55.7	....	N.	5.57	....	[illegible]	[illegible]
November	....	....	....	67.0	13.0	44.2	....	W.	2.51	....	[illegible]	[illegible]
December	....	....	....	62.0	12.0	43.8	....	N. W.	2.25	....	6	[illegible]
1892.												
January	....	....	....	59.0	9.0	36.6	....	N. W.	3.33	....	[illegible]	[illegible]
February	....	....	....	55.0	10.0	36.6	....	N. W.	2.24	....	[illegible]	[illegible]
March	....	....	....	59.0	17.0	36.9	....	N. W.	7.09	....	11	14
April	....	....	....	81.0	30.0	50.0	....	N. W.	4.41	....	[illegible]	[illegible]
May	....	....	....	84.0	43.0	61.0	....	S.	5.47	....	11	[illegible]
June	....	....	....	89.0	54.0	72.9	....	S.	2.43	....	4	
For the year.	....	....	....	74.7	31.5	[illegible]	....	N. W.	[illegible]		[illegible]	[illegible]

* Including melted snow.

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